



Nova Scotia

ANNUAL REPORT

for the fiscal year

ending March 31, 1998

Department of Natural Resources

During this reporting period

Minister
Honourable Ken MacAskill

Deputy Minister
William D. Hogg

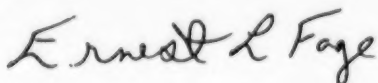
To His Honour

The Honourable J. James Kinley
Lieutenant-Governor of Nova Scotia

May It Please Your Honour:

I have the honour of presenting the report of the Department of Natural Resources for the fiscal year ended March 31, 1998.

Respectfully submitted,

A handwritten signature in black ink, reading "Ernest L. Fage". The signature is written in a cursive style with a large, stylized "E" and "F".

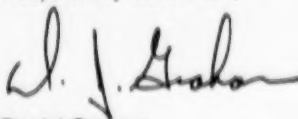
Ernest L. Fage
Minister of Natural Resources

The Honourable Ernest Fage
Minister of Natural Resources
Halifax, Nova Scotia

Sir:

I have the honour of presenting the report of the Department of Natural Resources for the fiscal year ended March 31, 1998.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'D. J. Graham', written in a cursive style.

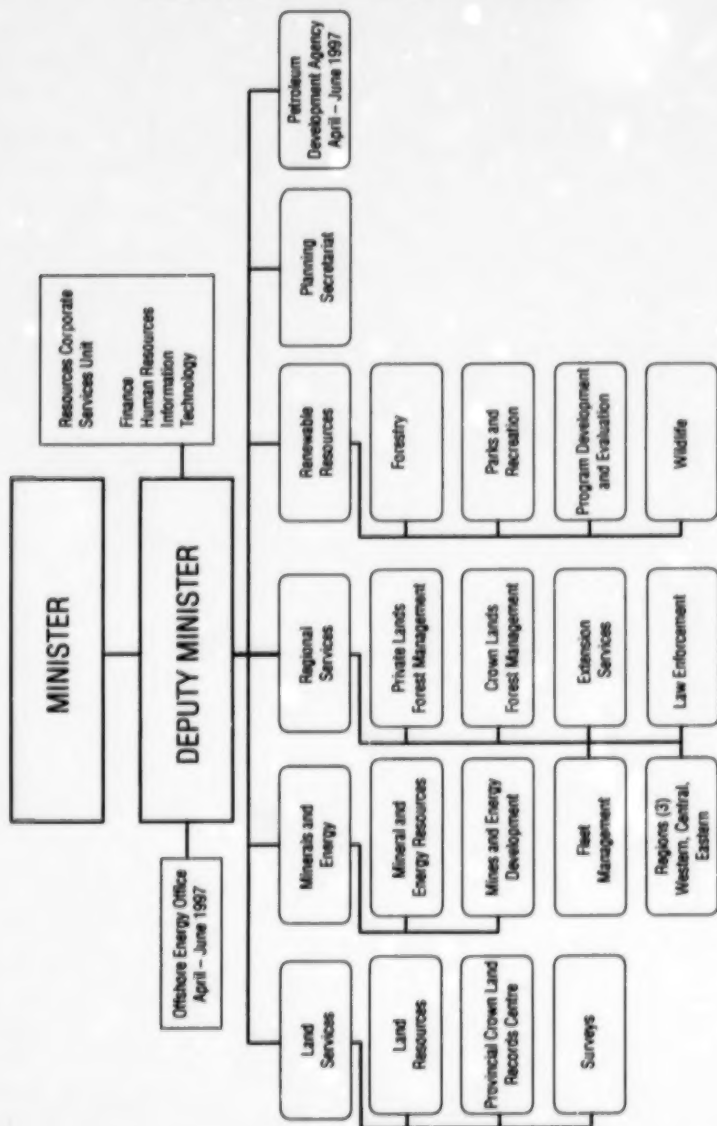
Daniel Graham
Deputy Minister



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DEPARTMENT ORGANIZATION 1997-98



DEPARTMENT FUNCTIONS

Department of Natural Resources
PO Box 698
Halifax, Nova Scotia
B3J 2T9

Minister
Kenneth MacAskill

Deputy Minister
William D. Hogg

The Department of Natural Resources has broad responsibilities relating to the development, management, conservation, and protection of energy, forest, mineral, and wildlife resources, and parks and protected areas. Through its legislation, the department administers and manages Crown lands; develops energy and mineral resources; implements forest management programs; protects the forests from fire, insects, and disease; develops and operates a system of parks; protects and conserves wildlife and other resources; and provides a secure, efficient energy supply for the province. The department also cooperates with other provincial and federal agencies in complementary or related programs.

Services are offered and delivered through four branches—Land Services, Minerals and Energy, Regional Services, and Renewable Resources. In addition, the department is responsible for a Planning Secretariat. Human resources, financial, and information technology functions are provided through the Resources Corporate Services Unit. In July 1997, the Petroleum Development Agency was transferred from the department and a Petroleum Directorate was created to deal with onshore and offshore petroleum opportunities.

**ACTS ADMINISTERED
BY THE DEPARTMENT OF NATURAL RESOURCES**

1. An Act to Confer Certain Powers Upon the Lieutenant Governor in Council and to Amend the Mines Act
2. Angling Act
3. Beaches Act
4. Beaches and Foreshores Act
5. Blueberry Associations Act
6. Bowater Mersey Agreement Act
7. Conservation Easements Act
8. Crown Lands Act
9. Energy-efficient Appliances Act
10. Forest Enhancement Act
11. Forests Act
12. Gas Storage Exploration Act
13. Gypsum Mining Income Tax Act
14. Halifax Power and Pulp Company Limited Agreement Act
15. Indian Lands Act
16. Kedgemakooge National Park Act
17. Land Holdings Disclosure Act
18. Land Surveyors Act
19. Land Titles Clarification Act
20. Mineral Resources Act
21. Natural Resources Advisory Council Act
22. Parks Development Act
23. Primary Forest Products Marketing Act
24. Private Ways Act
25. Provincial Parks Act
26. Scalers Act
27. Scott Maritimes Limited Agreement (1965) Act
28. Special Places Protection Act
29. Stora Forest Industries Limited Agreement Act
30. Trails Act
31. Treasure Trove Act
32. Wildlife Act
33. Woodsmen's Lien Act

DEPARTMENT EXPENDITURES AND REVENUES**Ordinary Expenditures**

Branch

Senior Management	\$ 1,196,855
Corporate Services	4,968,713
Renewable Resources	10,667,572
Minerals and Energy	4,214,979
Regional Services	26,916,464
Petroleum Development Agency	4,995,828
Planning Secretariat	2,416,531
Land Services	2,125,338

\$ 57,502,280

Resource Enhancement Fund

Forestry	5,200,842
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Total Ordinary Expenditures	\$ 62,703,122
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Ordinary Recoveries	3,180,006
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Net Ordinary Expenditures	 \$ 59,523,116
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Capital Expenditures

Land Acquisition	124,822
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Total Capital Expenditures	124,822
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Capital Recoveries	119,822
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Net Capital Expenditures	\$ 5,000
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Revenue	 \$ 9,621,324
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RESOURCES CORPORATE SERVICES UNIT

The Resources Corporate Services Unit provides finance, human resources, and information technology services for the departments of Agriculture and Marketing, Environment, Fisheries and Aquaculture, and Natural Resources.

FINANCE DIVISION

The Finance Division provides support in the areas of accounting systems, procurement, licences and accounts receivable, revenues, fees and recoveries, budget preparation and analysis, and financial analysis and advice on special projects.

The division provides a comptrollership function on behalf of the department and the Department of Finance and provides financial information to assist in complying with the Expenditure Control Act. In 1997-98, the division administered 149,167 transactions. Expenditures, including salaries, totalled \$116.4 million.

During the year, the division was responsible for collecting and reporting on approximately \$11.9 million of revenue for the resource departments.

During 1997-98 the Halifax Licensing and Accounts Receivable Section distributed and sold 84,925 hunting and 60,159 fishing licences. They also maintained a registry of over 250,000 persons eligible to purchase a hunting licence in Nova Scotia.

HUMAN RESOURCES DIVISION

The Human Resources Section of the Resources Corporate Services Unit provides human resource services including compensation, human resource advisory services, labour relations, occupational health and safety, organizational design, training and development, payroll/benefits, and recruitment.

As of March 31, 1998, there were 735 full-time employees with the Department of Natural Resources. The number of retirements for the fiscal year totalled 32. Three employees took the Early Departure Incentive Program.

Staff completed a training needs analysis. A calendar of training events was developed through a needs analysis. In addition to the calendar courses offered to employees, customized courses in customer service and conducting effective meetings were developed in-house at client requests.

A Performance Management Program was delivered to employees. In total, 165 employees from the four client departments participated in the two-day management training sessions, while 687 employees participated in the half-day staff training sessions across the province. A standard appraisal form was revised and introduced.

Staff participated in the development of a standardized recruitment process. A report outlining this process was submitted to the Department of Human Resources for approval and presentation to the Ombudsman, Nova Scotia Human Rights Commission, and Nova Scotia Government Employees Union. These processes, which were revised in accordance with the government's Fair Hiring Policy, enabled departments to address the requirement of recruiting trained individuals for specific positions.

The development of the Occupational Health and Safety program was coordinated and completed by December 1997. Occupational Health and Safety (OH&S) training was offered to staff across the province during the fiscal year. It included an introductory session with an overview of the responsibility for due diligence as it relates to the Occupational Health and Safety Act, as well as orientation to the Occupational Health and Safety program. In addition, a number of high-quality, cost-effective OH&S training opportunities have been identified to meet department training requirements for 1998-99.

Management training sessions were coordinated for the government's new attendance management program.

INFORMATION TECHNOLOGY DIVISION

As a result of the needs assessment conducted between June and October 1997 by the Resources CSU Information Technology (IT) Division, a service assessment report was presented to the four resource departments for approval. Several recommendations have been implemented.

A client service coordinator was hired for the department in February 1998 to coordinate IT resources. By March 1998, all IT casual employees and term positions were converted to permanent status to reduce the

reliance on casual staff. A process to establish and maintain IT priorities is under way within the department.

Infrastructure

Network changes were made in the Halifax office to improve network performance. These included implementation of a new file server and redesign of the network. In addition, a new network switch was obtained and will be installed once reorganization of staff in the Halifax office is completed. The provincial computer network connection to the Halifax office was upgraded to improve access to the Internet as well as to other departments and agencies.

The Kentville office was connected to the provincial computer network through the Department of the Environment facilities.

Year 2000 is a priority for the IT Division. An inventory of hardware and software components is being finalized. A full-time person, who is working with the Year 2000 Project Office established by the Technology and Science Secretariat, has been assigned to develop and implement a plan for determining which of the department's systems are Year 2000 compliant.

Business Solutions

The first phase of the Wood Buyers Registry system was successfully implemented in February 1998. DNR staff in Truro use the system daily. The second phase, providing reports, is under way.

The IT Division assisted the department in developing a request for proposals for the delivery of an Antlerless Deer Draw using telephone technology. The technology allows hunters to enter the draw by telephone from home.

In a preliminary step to automating the Mineral Rights Registry, detailed descriptions of registry processes and associated data were documented. This preliminary analysis, completed in February 1998, provided specifications and estimates for designing, developing, and implementing a new registry system. Registry staff devoted a considerable amount of time to participation in this project.

LAND SERVICES BRANCH

The Land Services Branch consists of two divisions: Land Administration and Surveys.

LAND ADMINISTRATION DIVISION

The Land Administration Division is responsible for the acquisition and disposal of land and interests in land, and the administration of Crown lands through the issuance of leases, licences, permits, and letters of authority.

Acquisition Section

There were 27 reconveyances of land to the Crown. See Tables 1 and 2 for total acreage by county and purpose.

Crown Land Disposals Section

Eighteen parcels of Crown lands, with a total area of 20 ha (49 a.), were transferred to other provincial departments and the federal government.

Twelve grant documents conveying 19 ha (47 a.) of Crown lands were issued.

Seventeen deeds conveying 1414 ha (3494 a.) of Crown lands were issued.

One hundred and eighty-four files were processed for letters of authority to allow the use of Crown lands for a variety of domestic and business purposes, including activities on inland and coastal waters.

Eleven files were processed for licences to allow the use of Crown lands (not including timber licences).

Thirteen easements were issued to allow the use of Crown lands.

Thomas Raddall Provincial Park, Queens County, was designated under the Provincial Parks Act.

Leasing and Claims Section

One timber licence extension was granted.

Seven Certificates of Title were issued under the Land Titles Clarification Act: one in Cherry Brook, two in East Preston, two in Terence Bay-Lower Prospect (all Halifax County); one in Sunnyville, Guysborough County; and one in Neils Harbour-New Haven, Victoria County.

Thirty-eight campsite leases with a total area of 15 ha (38 a.) were issued.

Thirteen special leases of Crown lands with a total area of 841 ha (2,078 a.) were issued for various purposes (not including campsite leases).

Written authority was issued to remove 21 unauthorized structures situated on Crown land.

Pursuant to the provisions of the Crown Lands Act, the department opened files to deal with claims to 13 parcels of ungranted land. Six certificates, including plan and description, were prepared by the Crown asserting no interest or claim to 162 ha (400 a.) of ungranted land. Four additional parcels were investigated and considered Crown.

SURVEYS DIVISION

The Surveys Division is responsible for all surveying, mapping, and land registration services for the department, and provides surveying and land registration services to other government departments and agencies.

Crown Land Surveys Section

The Crown Land Surveys Section managed the program with ten district Crown land surveyors situated throughout the province. Global Positioning System technology continues to play an ever-expanding role in our land surveying program.

There were 61 km (38 mi.) of Crown boundary surveyed requiring the placement of 278 survey monuments. The total area of Crown land surveyed was 1837 ha (4,540 a.).

There were also 28 km (17 mi.) of other boundary surveyed requiring the placement of 80 monuments. This work constituted a total of 354 ha (874 a.).

During the period, 682 km (423 mi.) of Crown boundary were maintained requiring the replacement of 1,116 wooden guide posts or corner posts.

There were 16 contracts with private Nova Scotia land surveyors for boundary line maintenance on Crown lands at a total cost of \$123 700.

Eight survey projects were executed for other departments.

Seventeen field inspections were executed on survey work performed by private Nova Scotia land surveyors working on Crown land for private citizens for such things as acquiring rights of way and leases.

One hundred and twenty-four Orders of Survey were prepared.

There were 2.5 person-years spent on GIS mapping and Crown boundary data input.

Staff took part in a major intergovernmental department Global Positioning System (GPS) campaign totalling 32 person-days. The 1997 Nova Scotia High Precision Network Densification was executed in Inverness, Victoria, Cape Breton, Richmond, Hants, and Kings counties.

There were 376 Crown corners coordinated using GPS technology.

Surveys Administration Section

The Surveys Administration Section is responsible for the inspection, approval, distribution, and permanent filing of all Returns of Survey prepared and submitted by district Crown land surveyors, as well as returns submitted by private land surveyors who carried out work on Crown lands.

The section is also responsible for preparing administrative plans for the issuance of Crown grants, leases, timber licences, and releases under section 37 of the Crown Lands Act. In addition, administrative notes must be added to plans regularly.

The section is responsible for the inspection of condominium plans on behalf of the Department of Business and Consumer Services.

Number of survey plans added to 20-chain map series	175
Survey orders (field plots) finalized	270
Compiled plans (timber licences, grant plans, leases) prepared	82
Section 37 plans prepared	0
Campsite lease plans prepared	60
Condominium plans inspected	11
Administrative notes added to survey plans	108
Information requests	30

GIS and Cartography Section

The GIS and Cartography Section is responsible for compiling and maintaining spatial and attribute data that make up the Crown Cadastral Database. This database consists of the following: Crown, ungranted, disposed, post, line, large privately owned parcels of land, and small managed parcels.

GIS maintenance (Crown)	1600 hours
Special projects (digital)	
Wilderness areas	1580 hours
Nature reserves	125 hours
Others	860 hours
Parks, Wildlife, etc. (manual)	250 hours
Updating Crown on 20-chain map series	475 hours
Geographic place names	1165 hours
Stora land management	1290 hours

PROVINCIAL CROWN LANDS RECORD CENTRE

The Provincial Crown Lands Record Centre coordinates provincial landholding information for all government departments and agencies, including all Crown land records dating back to 1731.

Pertinent information and documents relating to land holdings of 14 government departments and agencies were received by the Centre. Title, legal, and statistical information relating to 37,555 parcels of land has been processed, and the location and land use of properties have been plotted on Resource Series Maps. In total, 539 documents were received from the Registries of Deeds for land acquisitions by all departments.

Approximately 1,375 information requests were received, 550 that required searching vault material and 825 that required a written reply along with copies of pertinent information.

Sixty-six aquaculture lease requests were researched for the Department of Fisheries and Aquaculture and 44 Quieting of Title Action files were processed for the Department of Justice.

The Centre recorded and posted the following documents: 42 rejected petitions, 12 Section 37 Certificates, 3 C-Files, 39 D-Files, 77 leases, 5 Quieting of Titles, 43 land purchases, 11 grants, 6 Certificates of Title, 14 rail corridor licences, and 99 plot plans.

In 1997, the Registrar of Land Holdings received 126 disclosure statements for approximately 2,136 ha (5,277 a.) of land purchased by non-residents. Of the total number reported, 29 per cent were residents of Canada, 47 per cent were residents of Europe, and 24 per cent were residents of the United States.

The Centre is implementing a Land Records Information Management System which uses scanning technology for storing and retrieving documents. In addition, work to expand the branch's Geographic Information System (GIS) capability has begun.

Geographical Place and Feature Names Section

Approximately 100 inquiries for geographical names information were received during the year, mainly within government departments and some from the public and media.

Currently the software package MapInfo is being used to view the Nova Scotia Geographic Names Database. This package enables the user to view and edit all 25 fields of information.

During the latter part of the year, the responsibility for the Nova Scotia Geographic Names Program was transferred to the Department of Housing and Municipal Affairs, along with the person responsible for the daily activities of this program.

MINERALS AND ENERGY BRANCH

The Minerals and Energy Branch submission describes annual department activities. For further information on branch activities, contact the department library (phone 902-424-8633) or visit our web site (<http://www.gov.ns.ca/natr/meb>).

MINERAL AND ENERGY RESOURCES DIVISION

The Mineral and Energy Resources Division is the geoscientific arm of the Department of Natural Resources. It is responsible for providing a comprehensive, integrated geoscience knowledge base for the province. It supports mineral exploration and development; integrated resource management; sustainable economic development in non-mineral sectors; environmental protection; land-use planning; and scientific research. Division activities provide a thorough knowledge of the province's geological history and contribute to our understanding of its mineral endowment. Geoscientific information gathered in the division is distributed to a broad technical audience and the public to promote opportunities for mineral exploration and development, and to provide an impartial source of geoscientific information and advice on a broad range of issues.

The branch's mineral promotion initiative aims to increase the amount of exploration for and development of Nova Scotia's mineral resources through sound promotional activities. Highlights of the 1997-98 fiscal year included the 21st annual Review of Activities in November 1997 and attendance at the British Columbia and Yukon Chamber of Mines Cordilleran Roundup convention in Vancouver and the Prospectors and Developers Association of Canada in Toronto. In addition, meetings were held with representatives of local, national, and international mining companies to discuss mineral-related opportunities in Nova Scotia.

The publication *Properties Available for Option* in Nova Scotia, containing submissions from prospectors and companies, was prepared and circulated at trade shows. Articles and advertisements were placed in local and national publications.

Division programs are delivered through three sections: Geological Mapping and Geochemistry, Mineral Resource Evaluation, and Geoscience Information Services.

Geological Mapping and Geochemistry Section

The function of the Geological Mapping and Geochemistry Section is to develop a comprehensive understanding of the bedrock and surficial geology of Nova Scotia, to determine the broad geological potential for mineral resources, and to publicize the results of geological investigations to a technical audience including mineral and energy resource, environmental, hydrogeology, and geotechnical industries. Section activities range from reconnaissance to detailed geological mapping, including the study of selected geological units at the surface and in the subsurface.

Mapping of the Central Meguma Project area continued with emphasis on the Lucasville-Lake Major area. Significant advances have been made in documentation of the stratigraphy and structure of the Meguma Group, which hosts significant gold, lead, zinc, and antimony deposits with local barite and fluorite occurrences. Seven 1:10 000 scale geological maps from National Topographic System (NTS) 11E/04 were prepared and released in 1997. Twenty-six 1:50 000 scale Enhanced (Second Vertical Derivative) Aeromagnetic Digital Data Maps from the Meguma Terrane in southern Nova were released in 1997. A report on diamond-drilling in the North Beaverbank area was also released. Ten 1:10 000 scale geological maps from NTS map areas 11D/13 and 11E/04 were prepared for release in the summer of 1998. A 1:50 000 scale geological map of NTS map areas 11D/13 and 11E/04, including the adjacent Carboniferous strata in the Kennetcook and Shubenacadie basins, is being prepared.

Work on a preliminary map of the Guysborough area was completed and will be released in the summer of 1998.

Mapping and coal resource geoscience work in the Debert-Kemptown area continued, as well as a study of the roof strata geology and three-dimensional models in the Phalen Mine.

Work continued to complete the Musquodoboit Batholith geology maps and report. Fieldlog®-based maps and digital data from the Tangier Grand Lake area in the eastern part of the batholith will be integrated with Meguma Group compilation and mapping extending to the eastern shore region from the Central Meguma Mapping Project. A geological map and report on the south-central Cape Breton Highlands was released in 1997.

The Hants-Colchester Lowlands surficial geology project continued in the Shubenacadie-Musquodoboit and Lawrencetown areas. Two surficial geological maps were prepared for release in the summer of 1998. Seismic surveys by the Geological Survey of Canada and drilling by the Department of Natural Resources in 1995 and 1996 established the presence of extensive deposits of Cretaceous clay and silica sand in the Musquodoboit and Shubenacadie valleys. This work has stimulated extensive private sector mineral exploration activity (e.g., Kao clay Resources Inc.). Seismic and drilling data have established the presence of significant faults that occurred after the early Cretaceous in the Musquodoboit Valley. A report on late Quaternary glaciation and sea-level changes along the Atlantic coast of Nova Scotia was released in 1997. Processing results from some kaolin deposits were presented at the 33rd annual Industrial Minerals Forum.

Work continued on preparing a report on the geology of the western part of the basin as well as compilation of a new 1:50 000 scale geology map of NTS map area 21H/01.

Results of these projects were presented as talks, poster displays, and papers at scientific and special industry meetings locally, in other parts of Canada and in the United States. Numerous contacts, consultations, and presentations were made to industry and government clients. Further summary reports are included in the *Minerals and Energy Branch Report of Activities 1997* (Report 1998-1).

Mineral Resource Evaluation Section

The Mineral Resource Evaluation Section provides information specific to the province's mineral deposits and resource appraisal. Staff conduct detailed studies of mineral inventory, mineral deposits and mines, and map areas with suspected strong mineral potential. Information on the origin and location of known deposits is valuable in the search for related deposits.

The Mineral Inventory Program

During 1997-98, Mineral Inventory staff continued to verify mineral occurrences in selected areas. On Cape Breton Island, mineral occurrences discovered during exploration since the mid- to late-1980s were examined and included in the mineral occurrence database. These occurrences were not known when staff visited these areas in the late 1980s and early 1990s. Compilation of existing information and field verification of mineral occurrences in the Eastern Shore region continued during 1997-98. To date, most of the mineral occurrences between Halifax and Sheet Harbour have been field-checked.

Staff continued to work closely with the Geoscience Information Section to ensure integration of the most up-to-date mineral occurrence information available on the public-access GIS system.

Coal Basin Programs

The department undertook geoscience projects in most of the major coal-bearing basins in the province during 1997-98. These involved geological mapping and evaluation of energy and non-traditional resources. Mapping activities targeted areas with significant mineral and energy resource potential, but lacking detailed map coverage. Resource evaluation included the following: research into basin evolution and its influence on energy resources including lignite, coal, coalbed methane, and petroleum; geological studies in active coal mines, focusing on features that may prove a hindrance to underground and open pit mining; and community-based economic development of world-class fossil sites.

Mapping of the Upper Carboniferous strata adjacent to the Cobequid Fault Zone within the Debert-Kemptown Coal Basin continued during 1997-98. Maps have been completed at the 1:10 000 scale of this narrow belt of rocks from the Kemptown area to Folly River. A 1:20 000 scale map incorporating all recent mapping in the Stellarton Basin has been compiled and will be published in cooperation with the Geological Survey of Canada.

A detailed sedimentological description of the entire Joggins Formation in the type coastal section from South Reef, Lower Cove, to Dennis Point, south of MacCarrens Creek, was completed in a collaborative project involving Dalhousie and Edinburgh universities. This work updates the long-standing measured section of Logan (1845) for this important Upper Carboniferous reference section.

Mine geology projects were undertaken in the Sydney and Stellarton basins. In the Sydney Basin, department researchers and researchers from Dalhousie University and the Geological Survey of Canada studied the roof rock geology and outburst-prone sandstones of Devco's Phalen Mine. Work was also completed on the structural geology and roof stratigraphy of the Pioneer Coal open pit mine on the Foord Seam in the western Stellarton Basin. Initial work was completed on the geology of the Pioneer Coal open pit on the McBean Seam in the eastern Stellarton Basin. Initial mapping and resource evaluation for the Antigonish-Guysborough area was in the planning stage during 1997-98.

A comprehensive review of Carboniferous basins and resources and the resulting implications for the interpretation of Carboniferous resources and basin evolution was presented to the Geological Society of London. The paper will be published in 1998.

Scientific documentation of world-class fossil sites in the province's coal basins continued, with the goal of fostering sustainable, community-based economic development opportunities. The project focused on Joggins, Cumberland County, and Brule, Colchester County, with a third site at Sydney Mines brought to the attention of the Regional Development Association in 1997. The community at Joggins has requested that the United Nations designate the cliffs as a World Heritage site.

Mineral Deposit Studies

Base Metals: A summary of work on the Gays River and Walton projects was written in collaboration with Geological Survey of Canada geologists for a special issue of the journal *Economic Geology*. Reports were written on the investigations into the timing and nature of Cu-Pb-Zn-Ag mineralization at Dunbrak and Ba-F mineralization at the Kinsac pluton. Field work and followup studies on metallogeny in southeast Cape Breton were initiated and preliminary results presented in two papers for the *1997 Report of Activities*.

Tin: Work on pegmatites and their relationship to mineralization at East Kemptville has been submitted for publication in a geoscience journal. Papers resulting from a graduate thesis at McGill University have also been submitted for publication.

Gold: Activities of the Precious Metals Project were directed at re-evaluating temporal relationships and associated isotopic studies of veining and metamorphism at the Cochrane Hill and Moose River gold deposits; evaluating bulk gold potential in the Meguma Group; compiling information on gold deposits along the eastern shore; and serving clients.

Field investigations and subsequent petrographic and geochemical studies were undertaken to examine the paragenesis of gold and carbonates in the Touquoy Zone at the Moose River gold deposit. Preliminary investigations of the various gold deposits along the Eastern Shore of Nova Scotia were initiated as part of a multi-disciplinary study, which will continue over the next five years. The purpose is to compile all the relevant information on mapping, exploration, mining, and detailed deposit studies of the area and to publish a comprehensive report.

A paper on whole-rock $^{40}\text{Ar}/^{39}\text{Ar}$ dating of gold deposits in the Meguma Terrane has been accepted for external publication. Research continues in conjunction with the mapping section on the nature and origin of crack-seal textures in gold veins. An external paper was published on the West Gore Au-Sb deposit summarizing the results of isotopic and fluid inclusion studies. A review paper on morphology of the Meguma gold deposits was written and accepted for publication in the journal *Ore Geology Reviews* as part of a special issue on mesothermal gold.

Industrial Minerals

Barite-Fluorite: Studies on barite-fluorite veins in the Kinsac pluton continued, and several publications summarizing the results are in preparation or have been submitted for publication.

Kaolin: Various staff of the Mineral Resource Evaluation Section provided background information to mapping staff in their continued research into the potential for the development of economic kaolin deposits in Nova Scotia.

Aggregate Program: Department staff were asked to identify sand deposits for new cranberry production sites by the Nova Scotia Department of Agriculture and Marketing. Recent interest in expanding cranberry production in North America has resulted in an aggressive campaign to promote the province for this investment potential. One important aspect of cranberry production is the need for large quantities of sand as a substrate for the plants. Staff spent three weeks examining sand deposits in the Annapolis Valley in June 1997. Deposits were also looked at in southwestern Nova Scotia. Several sites were identified and a report was prepared. This information laid the groundwork for a more detailed sand study in the region under a private contract.

Fieldwork on the Annapolis Valley project continued in Digby and Yarmouth counties. This was the third year of identifying and evaluating the aggregate resource in the Annapolis Valley and surrounding region. All aspects of the resource were examined, including glacial sand and gravel deposits, till, bedrock potential, and all pits and quarries. At the same time the bedrock was examined for dimension stone potential. Field work on this project was conducted from late June until mid-October 1997. Most of Digby County and two-thirds of Yarmouth County were completed. The result of this study will be a database and resource maps available on the public-access GIS.

Geoscience Information Services Section

This section is responsible for the management and delivery of geoscience information services and products to government, industry, universities, and the public. Specific functions and services within the section are digital information and GIS services; mineral land-use planning and policy; minerals outreach and prospector assistance; geoscience editing and publishing; exploration monitoring and assessment report evaluation; and core library services.

Digital Information Services

The Digital Information Services group developed a Geographic Information System (GIS) for use by Minerals and Energy Branch staff and their clients. The GIS is a corporate information system that provides access to provincial and detailed digital data sets on geology, geochemistry, geophysics, and land use. A variety of data sets have been compiled and are available for purchase as ARC/INFO® export files (E00), AutoCAD® files (DXF), dBASE files (DBF), or image files (TIF). A list of digital geoscience data for sale is available through the Library or on the web site at <http://www.gov.ns.ca/natr/meb/pubs3.htm>.

To provide client access to digital geoscience data sets, a public access GIS is available for use in the library. This is a user-friendly system created in ArcView® which has the ability to display and query the digital geological, geochemical, geophysical, and land-use data sets in the main ARC/INFO® GIS for any area of the province, and to plot the derived, colour geoscience maps.

Work is progressing on the new 1:500 000 scale geological map of Nova Scotia. This is a compilation of recent maps, most of which have 1:50 000 scale detail and have had their content thinned. Hard copy and digital versions with attached databases will be made available.

The branch's Internet website (<http://www.gov.ns.ca/natr/meb>) contains information on activities and staff, a What's New page, a Topics page, all issues of the *Nova Scotia Minerals Update* newsletter, publications release notices, and the lists of publications and digital data for sale.

NovaScan is the provincial bibliographic geoscience database that provides access to publicly available geoscience documents concerning the Nova Scotia landmass and offshore regions. As of March 31, 1998, the database contained 14,160 Department of Natural Resources records

consisting of assessment reports, department publications, journal literature references, open file maps, open file reports, open file illustrations, theses, contribution series, digital data products, and outside publications.

Mineral Resource Land-use Information and Policy

The year's activities focused on providing geological, mineral resource, and land-use information services, advice, and technical assistance to the department's integrated resource management process. Staff also reviewed draft policies, legislation, environmental assessments and undertook other initiatives.

The Land-use group provided information and consulting services for:

- acid drainage potential and historical land use along the proposed natural gas pipeline
- geochemical data near Halifax's proposed composting facility
- geohazard potential near Oxford
- sources of sand and gravel for cranberry farming
- water quality over slates near Halifax Airport
- the recent collapse of the Economy River Falls
- mineral resource information to industry and non-industry clients
- reclamation areas to test the use of compost for slope stability, erosion control, and water retention
- geological and mineral resource information for planning a 100-series highway in the Hammonds Plains area

In-house activities included preparing thematic maps for public release; developing a digital Mineral Resource Land Use (MRLU) atlas; writing articles for the branch newsletter; advising a College of Geographic Sciences student's project in the digital compilation of the last 10 years of exploration history to determine staking patterns and areas of high economic/exploration interest; providing advice on mineral resource potential in final boundary selection for candidate protected areas; and maintaining the aquaculture licence review database.

Paper presentations were given at the Rural Development Conference in Truro, Voluntary Planning's (Mineral Sector) Forum on Land Access, and a course module for the environmental studies program at Dalhousie University. Presentations were also given concerning land-use planning in Canada, groundwater, and acid rock drainage.

The Land-use group prepared a draft IRM planning framework titled "Rules, Tools and Deliverables." Staff also provided technical advice and support to the regional IRM planning teams. Digital maps showing geology and mineral resource information were compiled for each region. In addition, water supply area maps and an associated database were compiled for the three IRM planning regions. Discussions continued on improving the integration of mineral resource information in the IRM process. A report was prepared for the IRM/LU committee on IRM processes, goals, and objectives in other jurisdictions. Reviews of IRM overview documents for the Western and Eastern regions were conducted. The Land-use group continues to participate in IRM team meetings for Central Region and in all stages of the planning process.

Reviews continued on the action plan for the department's Mineral Policy; draft Wilderness Act; Sustainable Development Strategy for the Department of Fisheries and Oceans; Nova Scotia's State of the Environment Report; draft Municipal Government Act; Watershed Management Strategy for Nova Scotia; and IRM overview reports for the Western and Eastern regions. Environmental assessment documents for the Riverland Development rock quarry in Upper Sackville were also reviewed.

Minerals Outreach Program

Helping various audiences understand and appreciate the importance of minerals and mining is the key objective of the Minerals Outreach Program. During 1997-98 this objective was met by preparing and delivering a variety of projects such as prospecting courses, teachers' workshops, class presentations, articles and newsletters, and public interpretive walks and by developing partnerships with museums.

The Special Audience Communication Strategy is a means of communicating the importance of minerals in the economies of Nova Scotia and Canada. Talks, discussions, and workshops with government, regional development authorities, service clubs, and chambers of commerce should provide a strong basis for support of the mineral industry. Talks on this theme were presented at the Rural Development Conference in Truro in July 1997.

One main focus of the program is to make teachers aware of minerals, mining, and mineral-based industries. Through class visits, work with teachers at annual in-service days, and the EdGeo Workshop, the minerals outreach program provides teachers with resources, knowledge, and practice to speak about mining and minerals. Each year DNR participates with the Geological Survey of Canada—Atlantic, the Nova Scotia Museum of

Natural History, local universities, and schools to provide a two-day EdGeo workshop about earth science resources for teachers. A major part of the 1997 workshop dealt with resources for teaching about rocks, minerals, and mining to students in grades 4 to 12.

Nova Scotia Mining Week took a look at mining through a variety of activities for teachers, students, and the public. The week, which coincided with National Mining Week, provided opportunities for the public to learn about exploration techniques such as gold panning, to tour a gypsum mining operation, and to see exhibits and demonstrations at local museums. School classes visited museums or actual mining operations. More than 800 students participated.

Prospector Assistance Program

A new Prospector Assistance Program officially began in July 1997. Funding for the program was received from the Canada-Nova Scotia Cooperation Agreement on Economic Diversification and has a value of \$600,000 over four years. This agreement provides support and encouragement for the growth of prospecting.

The Prospector Assistance Program (PAP) has three components: prospector training, prospector assistance, and marketing assistance. Although each component is independent of the others, all three provide a uniform approach to encouraging the development of the province's mineral potential.

Prospector training provides support for training entry-level prospectors in different locations throughout Nova Scotia. An advanced course will be offered as demand warrants and will give additional experience and practice to those who graduated from the basic course. Courses were held in Halifax and Sydney.

Financial assistance under the prospector assistance component provides a base level of support for individual prospectors to search for new mineral deposits and to attract larger companies to explore here.

The marketing assistance component of the PAP offers cost-shared financial assistance to prospectors for marketing their properties at various trade shows. Two prospectors attended the Cordilleran Roundup/Pathways 98 conference in Vancouver and 14 attended the Prospectors and Developers Association of Canada (PDAC) in March in Toronto.

Geoscience Editing and Publishing

The geoscience editing and publishing group edits scientific manuscripts and produces published documents for distribution. Staff provide consistent, high quality, timely, and cost-effective reporting on the geoscience activities carried out by the Minerals and Energy Branch. These activities may be published as scientific reports, memoirs, or maps, or may be presented in less technical publications such as information circulars or the branch newsletter, *Nova Scotia Minerals Update*. The newsletter is produced quarterly and distributed to more than 1500 subscribers. Many of the publications are available on-line on the branch website (www.gov.ns.ca/natr/meb). This ensures that current geoscience information on Nova Scotia is available to the public and promotes our mineral resources. In 1997-98, five papers were submitted to earth science journals, one (colour) map was published, four issues of the *Nova Scotia Minerals Update* were completed, and nine open file reports, 35 open file maps, two reports (including the *Minerals and Energy Branch Report of Activities*), and five information circulars were published.

Exploration Monitoring

In 1997, mineral exploration expenditure in Nova Scotia increased to an estimated \$8.9 million in 1997 compared with \$5.7 million in 1996 and \$2.8 million in 1995. The total number of general claims staked during 1997 decreased by 34.4 per cent to approximately 21,880. A total of 22,690 claims for all commodities were in effect at the end of 1997, represented by 890 exploration, coal, tailings, and special licences. The amount of exploration drilling increased from the previous year to a preliminary total 21 800 m compared with 15 600 m in 1996.

Exploration was carried out for gold, base metals, industrial minerals, and coal throughout the province. It was highlighted by the continuation of exploration and development of industrial minerals such as limestone, gypsum, kaolin, and silica sand. The lower Paleozoic Meguma Group of southern mainland Nova Scotia continued to be a focus for gold exploration in Nova Scotia and exploration for coal was undertaken in the Carboniferous rocks of northern mainland Nova Scotia.

Core Library Services

The Core Library in Stellarton houses an extensive collection of drill core and a variety of other geological samples, including well cuttings, rock slabs, geochemical samples, till samples, and some large samples of industrial minerals. These materials are obtained through exploration programs and other geological investigations conducted by the mining and petroleum industries as well as by other organizations. The core and sample donations

are catalogued and maintained for the use of government and educational and industry researchers to re-examine or re-analyse, or to conduct new projects. Reference documentation (logs, reports, maps) may also be consulted. This facility has an estimated value of more than \$40 million and is a resource for those developing Nova Scotia's mineral industry and increasing the knowledge of the province's geology and natural environment.

Approximately 5700 m of additional drill core was received from 46 holes in 1997-98, bringing the total to approximately 645 400 m.

Work continued on the development and upgrading of the branch's two microcomputer-based cataloguing and record-keeping databases. The Drillholes Database contains 21,000 records for more than 18,000 holes drilled during the last 100 years. The Drillcore Database contains information on more than 7,000 cores that are held in the Core Library collection. The two databases are linked to share corresponding data and are available to the public through OpenInsight® for Windows software on a common-user desktop computer. These databases are also fully searchable for any records available on drilling in Nova Scotia. The Drillholes Database is also accessible through the ArcView®-based public access GIS at the Core Library. The GIS enables map-based searches of the database and also enables drillhole locations to be shown on map printouts.

Branch services in the Stellarton area continued to be transferred to the Core Library facility as a result of the closure of the Mines Building on Bridge Avenue. Considerable time was spent during the year moving equipment, furniture, and working materials, and providing accommodation for the transfer.

MINES AND ENERGY DEVELOPMENT DIVISION

The Mines and Energy Development Division is accountable for exploration and development of the province's mineral wealth. Responsibilities include mineral resource regulations, mineral titles, and policies. The division administers mineral producers under the Mineral Resources Act. Mineral production and exploration statistics are compiled. The division also administers policies and programs to promote and regulate energy conservation and energy efficiency in Nova Scotia. This includes participation in the development of national and provincial initiatives directed at greenhouse gas emissions and climate change as it relates to energy. The Mines and Energy Development Division consists of three sections: Mining Engineering, Mineral and Petroleum Titles Registry, and Energy Utilization.

Mining Engineering Section

The Mining Engineering Section administers development of the province's mineral resources under the Mineral Resources Act. This includes reviewing proposals from industry for new mining projects or modifications to existing mines, and making recommendations for the issuance of mining leases, mining permits, and milling permits. The section provides mining engineering and mineral processing advice and assistance to industry and government and conducts economic analysis and feasibility studies on potential mineral deposits for promotional purposes.

The Mining Engineering Section manages the Coal Research Agreement. The section also promotes new opportunities for industrial mineral development and value-added mineral production.

No new mining leases were issued during 1997-98. Companies operating in Nova Scotia hold 42 mining permits.

Mineral and Petroleum Titles Registry

The Mineral and Petroleum Titles Registry is responsible for receiving applications for mineral and petroleum rights and for issuing and registering licences and leases. In addition, documents affecting licences are registered by this office. The Registry also receives statements of exploration expenditures and assessment reports that pertain to the renewal of licences and leases. Maps showing the disposition of lands under licence or lease are maintained and updated. Copies of these maps are available for a nominal charge. Applications for underground gas storage rights and treasure trove licences are also processed through this office. Information concerning production and employment in Nova Scotia's mines and quarries is received and compiled by the Registry and published annually.

There was a significant increase in licensing activity during the fiscal year. Many inquiries are answered each year from industry, the public, and other government departments. Most deal with procedures for obtaining licences, information on production for operating properties, and general questions about licences. The Registry is responsible for all fees, bonds, payments made in lieu of work, the sale of claims reference maps, and copies of pertinent legislation.

Total mineral exploration expenditures for 1997 (preliminary) were \$9 million. Mineral production in Nova Scotia for 1997 was valued at \$503 million with 3,860 people directly employed (Table 3).

Energy Utilization Section

Section staff represented the province in a federal/provincial/territorial effort to develop a national implementation plan to address Canada's climate change target for reducing greenhouse gas emissions agreed to in Kyoto, Japan, in December 1997. Staff also supported the Voluntary Challenge Registry, a national initiative to reduce greenhouse gas emissions, including providing advice on program enhancement and technical requirements.

Staff participated in negotiations on the Energy Chapter of the Internal Trade Agreement and monitored concerns about electricity reliability and pricing arising out of national and international electricity deregulation and restructuring. Staff members took an active role in support of the Model National Energy Codes and one staff member served as vice-chairman of the sub-committee responsible for developing computer software for code compliance.

The section continued to provide advice and information to industrial and commercial clients on opportunities for energy efficiency, with a focus on projects and seminars directed at the Investment Property Owners Association of Nova Scotia and the Building Owners and Managers Association. Staff addressed about 1500 requests for information on energy efficiency and energy statistics in 1997-98, continued to operate a video lending library, and distributed energy-related publications. Seven new or existing publications were produced or revised and a new video on energy-efficient housing was produced.

The section supported many industry initiatives to promote energy efficiency, including Nova Scotia's R2000 program, the 1997 R2000 Homes Showcase, two Canada/Trust Canadian Home Builders' Association EnviroHomes, and the 1997 Nova Scotia Home Awards. Over 300 housing industry members attended the seminar Cure for the Common Call Back, which was organized with private sector sponsors. Staff were instrumental in the organization and delivery of the award-winning Healthy Woodstove Campaign, which resulted in 1,000 information requests and replacement of more than 120 woodstoves with more efficient models.

Staff participated in several transportation projects including AUTOSMART, a program to deliver information on vehicle efficiency to driver education students, and a clinic to test vehicle emissions.

Staff delivered more than 30 technical presentations on energy issues to community colleges, housing industry retraining courses, professional associations, the real estate industry, and the wood heating industry. A staff member was elected to the Board of Directors of the Wood Energy Technical Training Program.

The section also maintained statistical databases, particularly ones relating to petroleum sales and pricing.

REGIONAL SERVICES BRANCH

Regional Services is responsible for delivering department programs and services through an extensive field office network. These programs and services include forest management programs and Crown land surveys; regional geological services; extension; education; enforcement; hunter safety; forest fire prevention, detection and suppression; monitoring of forest insects and diseases; operation and maintenance of provincial parks; resource conservation; and air services, fleet management, and radio systems.

The province is divided into three geographic regions, each staffed with a regional director, an integrated resource management chief, Crown lands forester, private lands forester, wildlife biologist, geologist, and accounting clerk. Within the regions are areas headed by area supervisors and staffed by senior technicians, forest technicians, field unit accounting clerks, maintenance personnel, and forestry crews.

PRIVATE LANDS FOREST MANAGEMENT DIVISION

In 1997-98, the department participated in four private land forest management programs. Two of these were jointly funded by the province and the private sector. The department's Resource Enhancement Fund—Forestry (REFF) had a budget of \$4 million. On the stand-alone REFF program, \$3,451,439 was paid for silviculture. The Joint Management Plan (JMP) was jointly funded by the Nova Scotia Landowners and Forest Fibre Producers Association (one-sixth), Stora Port Hawkesbury Limited (one-half), and the Department of Natural Resources (one-third). It paid \$2,030,105 in total assistance, of which one-third (\$676,701) came from the REFF budget. Eligibility requirements had to be met.

The Forest Stewardship Program (FSP) was also funded by the province. It paid \$114,714 in assistance for silviculture, of which one-third (\$38,238) came from the REFF budget. Half of the funding was provided by Stora Port Hawkesbury Limited and one-sixth by the producers from outside the seven eastern counties who supplied wood to Stora. Eligibility requirements had to be met.

The Cape Breton Enhancement Program (CBEP) was federally funded for Cape Breton Island. It paid \$95,575 in assistance for silviculture.

There were 13 011 hectares (36,120 a.) of private land treated through these programs (See Table 4).

CROWN LANDS FOREST MANAGEMENT DIVISION

Licensed Lands

The department has 50-year licence and management agreements (wood supply and forest improvement) with two pulp and paper companies. Each company submits for approval an annual plan outlining the proposed cutting and silviculture on the licensed Crown lands. Department staff monitor these operations in progress and when completed with field inspections (Tables 5 and 6).

The agreement with Stora Port Hawkesbury Ltd. of Point Tupper includes approximately 607 042 ha (1,500,000 a.) of Crown lands in the seven eastern counties. The agreement with Kimberly Clark Ltd. of Abercrombie Point includes approximately 82 153 ha (203,000 a.) of Crown lands in Halifax County. In 1997-98, funding was available for silvicultural treatments on these Crown lands.

Unlicensed Lands

Crown lands available for forestry operations, but not under 50-year licence and management agreements are referred to as unlicensed lands. The wood volume commitments under 10-year stumpage agreements are fulfilled from these lands. Mature forest stands are designated by the department for cutting under approved annual operating and cutting plans. The department has stumpage agreements with lumber companies and one hardboard manufacturer granting the right to cut and remove specific volumes of wood on designated Crown lands (Table 5).

Table 6 shows the silviculture work done on the unlicensed lands through silvicultural contract with licensees holding the harvest right or by silviculture contracts and timber licences awarded by the department through the tender process.

Pre-planning for all forest operations on licensed and unlicensed lands includes an assessment and consideration of other potential resource uses, such as forest/wildlife habitat, recreation, protection of wilderness areas, key biotypes, and water quality protection. This pre-planning is now referred to as integrated resource management. Silviculture prescriptions, including appropriate follow-up treatment, are assessed at the time of harvest.

ENFORCEMENT DIVISION

The Enforcement Division continues to update and develop the operations manual, which Regional Services staff use to carry out department programs.

Conservation officers are wearing a new uniform. One change is a new shoulder flash that identifies staff as conservation officers.

The dog section was expanded from two to three service dog handlers. The new handler is located in the Baddeck office.

Two officers attended the National Intelligence Surveillance course in Edmonton, Alberta. Another officer attended the National Covert Managers course in Prince Albert, Saskatchewan. These officers can provide assistance and expertise to other officers in the field of special investigations.

The department signed an agreement with the Department of Fisheries and Aquaculture that allows us to employ 14 assistant conservation officers (ACOs) to focus on inland fishery enforcement. This is the third year of this agreement and the program has been a success. In 1997 officers checked 5,953 fishers and issued 70 charges and 128 warnings. The Enforcement Division also signed an agreement with Environment Canada that enables the department to extend the employment of some ACOs to focus on migratory bird enforcement.

The testing of hunting guides was revamped during 1997. Development of provincial standards and a Guide Testing Board for new guides are two positive changes in the delivery of this program. Guide Testing Board members are from the guiding industry.

Tables 7, 8, and 9 detail changes, warnings, and known infractions of departmental legislation by the county in which they occurred.

EXTENSION SERVICES DIVISION

The Extension Services Division coordinates the branch's activities in hunter education, youth education, woodlot owner education, Christmas tree grower support, and forest worker training, as well as training and support for staff in extension methods and new programs related to the Registry of Buyers and integrated resource management.

In 1997, 1,481 students were trained through the Atlantic provinces Firearms Safety/Hunter Education course and 1,177 received training in the Canadian Firearms Safety course. A total of 162 courses were taught. There are 230 instructors who teach the Firearms Safety/Hunter Education courses. During 1997, 338 students were trained in 14 courses by the Bowhunter Instructors Association of Nova Scotia. Three hunting incidents involving firearms were reported; none was fatal.

Forestry education programs for youth are delivered primarily at the Musquodoboit Forestry Complex by Education Section staff. They provide unique natural resource education programs for their clients. School children, teachers, and chaperones, and youth-oriented groups like Girl Guides and Scouts participated in 28 education programs. The programs are designed to provide hands-on learning experiences in a natural outdoor setting, where a sense of stewardship of our natural resources can be fostered. Approximately 8,900 people participated in the various education programs.

The annual Christmas Festival of Trees is an event that attracts visitors to the complex. It promotes the use of natural balsam fir Christmas trees and facilitates unique community participation in the weekend activities.

Located behind the complex is an educational woodlot that focuses on integrated resource management. A popular feature of this woodlot is the numerous hiking trails that provide visitors with information on resource management. A variety of interpretive mediums including signage, brochures, and guided walking tours offer visitors valuable knowledge about the forest ecosystem while they stroll through the forest.

In addition to the youth programs offered at the complex, the division coordinates the delivery of a forest education message to school children during National Forest Week. The National Forest Week theme in 1997 was "Canada's Forests—Varied Treasures." Department staff provided support materials, including activity sheets, booklets, posters, and seedlings to grade 6 classes throughout the province during visits.

A new woodlot management home study course entitled *Managing Woodlot Finances: Planning and Investment Guide* was developed. This course and others in the series have been sent to approximately 500 landowners. The Forest Engineering Research Institute of Canada (FERIC) reports were advertised and sent out on request.

These activities fit in with the newly developed Woodlot Sector Education Program, which focuses the department's woodlot education efforts. Two goals of the program are to tailor DNR's education efforts to meet the landowners' needs and to provide landowners with more information.

The department recognizes landowners' efforts in sustainable forest management practices by presenting the Woodlot Owner of Year Award each year. In 1997, Anthony van Dyk of Caledonia, Queens County, received the award at the annual field day held in September. Approximately 200 people met Mr. van Dyk and visited his woodlot. This was the eighth year for this program.

Two department Christmas tree specialists, with the assistance of 22 Regional Services staff, provided advice to more than 2,000 Christmas tree growers, including information on general culture, nutrient management, integrated pest management, forest protection, marketing, and export requirements. The research, integrated pest management, and tree improvement program was coordinated by the specialists and passed on through individual consultations, meetings, and field days. Seven field days were coordinated by the specialists providing information to approximately 500 growers. With the assistance and support of the Department of the Environment, the first pesticide recertification was initiated for Christmas tree growers. Specialists also provided information to media, other government departments, and the public.

The Nova Scotia Christmas tree grade was coordinated, and two courses and two refresher courses for previously licensed graders were held. Administration of the grade was also completed by specialists.

The Boston tree, a gift of the province to thank Bostonians for their help after the Halifax explosion in 1917, was obtained, cut, and delivered.

Division staff continued to provide technical assistance for various training initiatives for the forest industry. These included the Forest Regional Training Council, safety and training committees of the Nova Scotia Forest Products Association, Nova Scotia Community College's Program Advisory Committee for Forestry, and Association of Woodland Trainers.

The division also provides training support to department staff. The annual extension workshop was hosted for 20 department staff at the Museum of Industry in Stellarton. This workshop provides an opportunity for

staff to enhance extension skills and share ideas with others on existing and future projects. Staff information sessions were held in late October 1997 to familiarize department staff with proposed regulations pertaining to the establishment of the Registry of Buyers. Following the approval of these regulations, information packages were distributed to department staff. Other initiatives included a news release, advertisements, and information about the Registry on the department website.

Integrated resource management consultations were conducted in Halifax and Hants counties. Extension staff participated in the consultation planning process and helped facilitate consultations. The focus of the consultations was to obtain input and suggestions from stakeholders on the future management of Crown lands and resources.

FLEET MANAGEMENT DIVISION

The Fleet Management Division, located in Shubenacadie, provides motor vehicle and heavy equipment requirements within the department, and aviation services and the integrated mobile radio system to government departments and agencies, including the RCMP and ground search and rescue.

Aviation Services Section

The department maintains and operates a fleet of aircraft, one fixed-wing all-weather airplane and five helicopters, which provide service to all government departments and agencies. The primary functions include ground search and rescue, forest fire detection and suppression, support in provincial emergency situations, resource development and management, and medical support flights.

During the fiscal year, Aviation Services flew 1584.3 hours in support of resource development and management and transportation throughout government. During the year 353.3 hours were flown on fire patrol and water bombing missions. Two medical support missions were flown and 33 searches for missing persons totalled 105.5 hours. A total of 2043.1 hours were flown in 1997-98.

Integrated Mobile Radio System Section

The department operates and provides a 24-hour, 7-day-a-week communication service for five networks: fire departments, DNR, government services, health services, Department of Transportation and Public Works, and the RCMP.

Operators receive calls from the public on a toll-free line and are responsible for notifying district personnel in regard to law enforcement issues, forest fires, and wildlife inquiries.

Operators monitor and relay system faults to the system contractors to ensure minimal communication disruption to the networks, as well as other users (Nova Scotia Power Incorporated, Stora Forest Industries, Bowater, etc.).

Mechanical Services Section

The department operates and maintains a fleet of approximately 700 pieces of equipment, including more than 200 vehicles and heavy equipment in support of department programs and services. Maintenance of the fleet includes everything from minor preventative checks to major equipment overhauls, and paint and body reconstruction. Mechanical Services tracks the fleet and replaces vehicles as required.

RENEWABLE RESOURCES BRANCH

The Renewable Resources Branch coordinates and provides leadership on policy, planning, and program development, including development and resource promotion, marketing, and resource inventory and research. The branch also prepares strategies and plans for integrated development, management, and conservation of renewable resources. The branch consists of four divisions: Forestry, Parks and Recreation, Program Development, and Wildlife.

FORESTRY DIVISION

The Forestry Division coordinates integrated resource management for renewable resources; develops and conducts research to improve forest management practices and develops strategies for sustainable development; maintains a provincial forest inventory and digital database; compiles and reports data relative to forest resources; coordinates the provincial forest fire management and integrated pest management programs; and manages the Province's forest nursery.

Forest Nursery Operations

In 1997, the Strathlome Forest Nursery distributed 4,315,231 seedlings. Seedlings were distributed by REFF-assisted agencies (1,664,546); small private landowners (763,270); Crown agencies (367,336); large landowners (1,484,558); and other agencies (35,521).

Boy Scout organizations planted 55,343 trees.

Tree Breeding Section

The Tree Breeding Centre is responsible for coordinating the overall program of the Nova Scotia Tree Improvement Working Group (NSTIWG) as well as fulfilling the department's operational commitment to this effort. The section also provides seed storage and testing services, as well as tree distribution assistance to the provincial nursery in Strathlome.

Establishment of additional genetic field tests included a white spruce polycross test series and a red spruce polycross test series. White and red spruce selection plantations were also expanded at four locations. A

Norway spruce source trial and block planting were planted at three plantations locations. A highland black spruce block planting was grown at the Tree Breeding Centre and then planted by Stora in the Cape Breton Highlands.

Very little breeding work was undertaken in 1997 because of a lack of flowering on virtually all species of spruce trees. However 566 trees were injected with gibberellic acid to induce flowering for 1998. Pollen was again collected in Lawrencetown and stored for future breeding.

Test maintenance was carried out on a number of established tests and included ten sites manually treated with herbicides, seven sites on which unwanted hardwoods and softwoods were removed manually, and eight sites that were treated by brush saws.

The 1997 grafting program resulted in 1,230 black spruce trees available for second generation orchard expansion. An additional 268 balsam fir were propagated in conjunction with the Nova Scotia Christmas Tree Council. These grafts will be planted in a Debert orchard and clone bank. Landscape stock for use in provincial parks and during Arbor Day events were also produced at the Tree Breeding Centre.

Staff continued to manage two orchards in the Annapolis Valley. The Lawrencetown and Kentville district offices supported the operation of these orchards. The only operational seed harvest occurred at the Aldershot black spruce orchard with a collection of 18 hl of cones, which in turn yielded three million viable seeds.

Six tours were provided to various organizations, including community colleges and the Nova Scotia Agricultural College, and to forestry colleagues.

Forest Inventory Section

In order to manage our forests on a sustainable basis, reliable forest resource inventory information must be available. The Inventory Section has been collecting this data for over 30 years. As the next century approaches and pressure is applied to the resource base from various users, it is critical that staff continue to collect reliable resource information and make it available.

Field Sampling Programs

Forest inventory programs continued during the summer of 1997. Approximately 340 temporary sample plots were measured in the western half of Halifax County. This is the last set of temporary sample plots to be

measured in the province. Staff will be moving to a new approach to forest field sampling based on a program of expanded permanent sample plots (PSPs). Approximately 3,800 PSPs will be measured over a five-year cycle, with 760 plots measured across the province annually. The program is being designed and will be implemented in the 1998 summer field season. The new design includes parameters intended to better monitor forest biodiversity.

Spatially Related Forest Resources(SRFR) Database

The section continues to update the forest cover type database residing on the geographic information system. Colchester County has been updated as a result of the re-interpretation process. Cumberland County is being re-interpreted and digitized and will be updated by 1999.

The wildlife data layer is complete on mainland Nova Scotia, except for Hants and Halifax counties. These two counties are under development, along with Cape Breton and Richmond counties.

Other finalized layers include the wilderness areas. In addition several layers and map products have been produced for the IRM process for Western Region.

The section also provided a digital data set to the Nova Forest Alliance and is providing inventory support to the alliance as required. The data set includes portions of Halifax, Hants and Colchester counties and covers approximately 458 000 ha.

Satellite imagery is being used to update cover type maps for Pictou, Antigonish, and Guysborough counties. New maps will be produced during 1998.

Aerial Photography

The section annually contracts out the acquisition of true-colour 1:10 000 scale aerial photography for portions of the province. The photography is used to update forest inventory information on a geographic information system and is also sold to the public through the Department of Housing and Municipal Affairs. One-tenth of the province is flown each year. During 1997, new photographs were acquired for Pictou, Antigonish, and half of Guysborough counties. In addition, a special set of photographs was acquired for identifying the location of the whitemarked tussock moth infestation in Colchester and Pictou counties.

Photo interpretation continues for Cumberland County. The updated data will be available early in 1999. Approximately 180 forest stands in Colchester County were intensively measured by an independent field crew to assess the accuracy of photo interpretation. In addition, the department photo interpreters field-sampled 15 per cent of their own interpreted forest stands.

Scaling

The chief scaler provides expertise to forestry companies with regard to scaling practices throughout the province. Twenty-eight candidates attended a scaling school in October. Approximately 25 licensed scalers attended the compulsory refresher course.

Scaling of wood harvested from Crown lands was monitored in cooperation with Regional Services staff. Assistance was provided to Regional Services staff in resolving scaling disagreements.

Forest Production Survey

The Inventory Section used data collected by Regional Services staff to produce the 1996 Production Survey Report. The demand for roundwood in the province continues to rise and reached a level of approximately 5 607 640 cubic metres of solid wood in 1996. Detailed reports can be obtained from department offices in Truro or Halifax.

Forest Planning and Research Section

The Forest Planning and Research Section is responsible for improving forecasts of sustainable wood supply levels; increasing the quality and diversity of our forest ecosystems; developing improved forest management practices to increase cost-effectiveness, forest growth, and yield and environmental sensitivity; providing engineering services for provincial Crown land and park infrastructure programs; and improving the cultural practices of the Nova Scotia Christmas tree industry.

Forest Management Planning

Forest planning activities for the section included preparing an updated wood supply analysis for Nova Scotia; development of a forest practices code for the management of Crown lands; staff participation on the Ecological Technical Committee to develop an ecological land classification system for Nova Scotia; compilation of the Nova Scotia statistical base for the Natural Forestry and Regeneration Database; and development of a strategy for hardwood management in Nova Scotia.

Staff participated in the development of a proposal to establish in Nova Scotia a model forest associated with the Fundy Model Forest in New Brunswick. The adjunct model forest, known as the Nova Forest Alliance, includes 450 000 ha of land in Halifax, Hants, and Colchester counties. Initial projects will address issues unique to Nova Scotia's land base. It will also test and extend the work on sustainable forest management being carried out in the Fundy Model Forest. The Nova Forest Alliance was formally established in February 1998.

Staff published the first annual *Forest Research Notes* in January 1998 to highlight activities and research results produced by the section. Staff are establishing a website to include digital availability of all completed and published research reports for the section.

Regeneration

Staff finished establishing three trial sites in conjunction with Bowater to determine the impact different harvesting equipment has on natural regeneration at the time of harvest. Trial sites were harvested and regeneration plots established to record damage to existing regeneration from the different types of machinery used.

Some older plantations established with container stock in Nova Scotia are now approaching 20 years of age. Reports from other jurisdictions around the world indicate that stability of these older plantations is a concern in certain situations. Staff acquired equipment to test for tree stability. Initial field work was carried out to refine methodology and establish baseline stability measurements in Nova Scotia.

In conjunction with Kimberly Clark, an assessment of white pine weevil damage to Norway spruce plantations was carried out. The assessment looked at Norway spruce susceptibility and recovery from weevil attack and various other identifiable damaging agents. Approximately 1500 individual trees were assessed.

In conjunction with Stora, three trial sites were established on the Cape Breton Highlands in recently established shelterwood cuts. Regeneration plots and small under-planting trails were established at each location.

Stand Tending

The goal of this group is to lower silviculture treatment costs, establish operational effectiveness of stand-tending treatments, and establish stand-tending trials for management to improve stand and tree quality for timber

production. The group also explores manual and chemical methods for competition control and developing alternative methods for achieving free-to-grow conditions in young managed forests.

Staff finished establishing pre-commercial thinning trials in both hardwood and softwood stands. Trials to determine both timing and spacing to manage for growth and quality of hardwood sawtimber were completed in yellow birch and white birch stands. An alternative method to reduce weeding costs in plantations was started in eastern Nova Scotia. Early manual thinning to within two feet of crop trees is being tested for effectiveness and cost savings compared to conventional manual weeding methods.

Two trials to measure the effectiveness of alternative competition control methods in plantations were remeasured. The first measurement of the success of the fungus *Chondostereum percreans* in controlling red maple sprouting was completed, and the third and final measurement of the crusher-sprayer herbicide site preparation trials was completed.

Staff completed Forest Research Report No. 65 (*The Efficacy and Cost of Four Herbicide Products Applied Using Selective Methods*).

Several reports on stem decay found in older PCT stands and comparison of cruising methods are in progress.

Growth and Yield

During the year, 159 permanent sample plots (PSPs) were measured. These measurements are used to refine growth and yield predictions, improve wood supply analysis and provide stand projections for Nova Scotia's forests. They include measurements taken in managed and unmanaged softwood, hardwood, and mixedwood areas.

A beta version of a hardwood growth and yield model for Nova Scotia was completed based on the PSP data. This model is used to evaluate the outcome of various silviculture treatments on the growth of hardwood stands, including the effects of pre-commercial and commercial thinning to various intensities.

Four field trips were carried out to demonstrate the results of various silviculture treatments on growth and yield, mainly focusing on commercial thinning in hardwood and softwood stands. This included tours for

delegations from Holland, New Brunswick, Newfoundland, and the local forestry community.

Presentations were given at Canadian Woodlands Forum workshops on the effects of thinning on hardwood and softwood growth and yield. The softwood presentation resulted in an article published on the effects of thinning timing on yield in previously pre-commercially thinned red spruce stands.

Initiatives have been undertaken in determining appropriate alternative harvesting methods for Nova Scotia. Promising alternative hardwood harvesting methods have been identified for testing in Nova Scotia. In addition, methods have been developed to assess quality potential in hardwood stands. Analysis has been initiated to determine the affect of spacing operations on the quality of hardwood trees.

Ecosystem Management

Modified harvesting systems were assessed to determine impacts on regeneration to crop tree species such as red spruce. Further work was done to determine the effect of the treatment on revegetation to non-crop species such as raspberry and pin cherry. The harvest systems are also being assessed to determine the ecological advantages of the harvesting system in particular group retentions of trees and buffer strips along streams and travel corridors through the harvested areas.

Field work was done to evaluate sampling procedures that could be used to quantify the attributes of old growth softwood stands. Preliminary data was collected on stand age, structure, coarse woody debris component, and diversity of vegetation.

In response to proposed revisions to the Forest/Wildlife Guidelines and Standards, staff evaluated the impact of a reduced stream width on the amount of forest land that would be required to provide a streamside buffer. The study compared stream identification on two types of map projections to the actual waterway in the forest.

Staff continued to work on a divisional team to develop an ecological land classification that attempts to identify ecologically similar areas at various scales of mapping or resolution. This classification will assist forest managers in planning, managing, monitoring, and reporting forest resources within a sustainable forest management system. Preliminary work was also started on an old growth strategy for Crown lands.

Christmas Trees

Several projects designed to assist the province's Christmas tree industry were initiated and/or continued from previous years. Three plantations of exotic fir species and native provenances of balsam fir have been established at Alder River, Guysborough County, Springfield, Annapolis County, and Mount Thom, Pictou County, and require yearly maintenance to ensure optimum growth. These plantations allow growers to evaluate tree performance. Staff also participated in several industry field days and information sessions.

Wood Supply Analysis

Through the efforts of the wood supply working group and steering committee, the process to complete the next Nova Scotia wood supply projection has progressed to the final stage of scenario and sensitivity analysis. Following completion of a final review the wood supply report for Nova Scotia is intended for release in 1998. Staff also provided responses to wood supply queries from the forest community.

Engineering

A total of 15 construction contracts were completed for Parks and Recreation and for Crown land roads. Hydrology reports and bridge designs were carried out for six forest access road bridges. Some 11 abandoned railway inspections, recommendations, and designs were done for sections of railway throughout the province. The construction contract was also revised, as it is every year.

Forest Protection Section

Forest Protection is responsible for the coordination of wildfire management, the acquisition, distribution, and maintenance of fire control equipment and coordination of provincial integrated pest management programs.

Fire Management

The 1997 fire season in Nova Scotia was average for the number of fires during the last 10-year period, but below average in area burned. The first fire occurred on March 20 and the last on October 26. In all, 371 wildfires burned 564 ha. Related structure fires resulted in losses of about \$36,000. The spring fire season consisted primarily of grass and barren fires. In April and May, 121 fires (33 per cent of the total) burned 393 ha (70 per cent of total).

Unprecedented low rainfall amounts in July and early August resulted in a ban on open fires starting July 15. This was followed by a ban on woods

travel on July 28. Moderate rainfall in early September slowed down fire activity, however a drying trend in mid-September raised the fire weather indexes to high levels in some areas. This dry period continued well into October.

For 12 days in July, one CL-215 water bomber was borrowed from Newfoundland through the national mutual aid agreement to supplement existing equipment. DNR aircraft were used on 55 fires (15 per cent of total). The Bell 212 and helitack crew were called out 14 times.

Prevention

Fire prevention presentations were made at elementary and pre-schools. Tours of the Fire Control and Air Services facilities were also provided. Smokey the Bear prevention trinkets were distributed at many of these functions. Smokey made appearances at 50 or more DNR, forest industry, and other functions.

Daily fire weather indexes were supplied to the forest industry, radio and television stations, and various weather agencies for information and distribution. Issuance of burning permits was reduced when the fire ban and woods travel restrictions were in place during July and August. Of the 12,580 burning permits issued, only 13 escaped control (0.1 per cent) and burned 13.4 ha.

Training

- A basic fire suppression course was developed to standardize training province-wide. This is the first project in the development of Nova Scotia's fire certification system.
- A muskeg operator's course was carried out in July.
- A crew boss course is being developed for implementation next season.
- A series of initial attack workshops was carried out in the Western Region of the province, with the district crews using the assistance of the helitack crew.
- A training program is being developed to standardize training of volunteer fire departments.

Training certificates were issued and recorded in the database at Shubenacadie. Training materials were provided to districts when requested. District staff also conducted training with local fire departments and fire crews.

Equipment

- The final Fall Arrest System (TS Rail) was installed for our fixed tower lookout network.
- A fire simulator package was purchased from MIMMS and its installation and operator training were completed in October.
- Scotty's nozzle foam induction system was evaluated. Preliminary results show that it will be a viable product after minor modifications.
- Final touches are being made on the geographic information system. Maps depicting spatial arrangement of fuels should be ready for the 1998 fire season.

Integrated Pest Management

Integrated Pest Management (IPM) is part of the Forest Protection Section. The main responsibilities of IPM are to identify, monitor, and assess insect populations and forest disease conditions in Nova Scotia (primarily forest pests); organize and conduct vegetation management spray operations on Crown lands and control noxious weeds in provincial parks; and recommend management strategies and carry out forest insect and disease education projects and displays.

Staff are also involved in various research projects and surveys with the federal government and private industry.

IPM is located in Shubenacadie. The lab is known as the Insectary. Five permanent staff members and varying numbers of casual staff carry out the responsibilities.

The winter of 1997-98 was a repeat of the last two winters: mild with little snow. The spring started out cool and wet, but by the end of May the weather turned hot and dry. The drought of 1997 helped forest defoliator populations increase. Exceptions were the forest tent caterpillar, satin moth, and spring cankerworm, which were hard to find and only a few reports were received. Abiotic forest and tree problems associated with drought conditions were more common. Everything from single trees to several thousand hectares of forest were affected by factors that ranged from massive hail and wind damage to drought damage.

Spruce Budworm, *Choristoneura fumiferana* Clem.: Staff conducted an aerial survey to determine the extent of defoliation caused by the spruce budworm. No defoliation was found in 1997. A province-wide pheromone trap system was set up with 130 traps. Moths were found in some traps for the first time in three years.

The annual L-2 survey consisted of 65 sample points collected across the province. As a result of the drought, there may be a large flower crop on spruce and fir trees next year and the budworm population in this Nova Scotia could increase significantly.

Eastern Blackheaded Budworm, *Acleris variana* Fern: Larval populations of this insect appear to be increasing again this year, particularly in the Marianna Road/Norman Fire Tower area of the Cape Breton Highlands. Defoliation caused by this insect was easily detected from ground observations, with the larva still present in its feeding chamber. This insect was observed in low numbers in the Creignish Mountain area of Inverness County. No finds were detected on the mainland.

Spruce Beetle, *Dendroctonus rufipennis*: The beetle population continues to expand in distribution and density across the province. The most active areas of expansion appear to be in the North Mountain and Digby Neck area of western Nova Scotia and in lowland Cape Breton where white spruce occurs. Staff were unable to complete the major aerial survey for 1997, but will try to complete it in the fall of 1999. It is estimated that 8 000 to 10 000 ha of mainly mature white spruce are affected, suffering mortality.

Gypsy Moth, *Lymantria dispar* L: Gypsy moth populations remained stable in areas where populations are already established in western Nova Scotia. To keep track of populations, the department did a number of joint surveys with the provincial Department of Agriculture and Marketing and Agri-Food Canada. Detection surveys were done in the Eastern Region and delineation surveys were done in the Western Region. The results show the population has remained stable.

Hail Damage: An area of 2 300 ha of hardwood defoliation/dischouration was mapped in early September 1997. This defoliation resulted from a severe hail storm which damaged tolerant and intolerant hardwoods and left characteristic elliptical wounds on the twigs and small branches.

Balsam Fir Sawfly, *Neodiprion abietis*: A large area of balsam fir sawfly (BFS) defoliation in balsam fir occurred in coastal eastern Halifax County and western Guysborough County. Gross area of defoliation was mapped at 26 739 ha of low, 189 ha of moderate, and 272 ha of severe defoliation for a total of 27 200 ha. Severe defoliation and some mortality occurred in recently thinned balsam fir stands. This problem is increasing and is starting to have an impact on stand management in these areas.

A previous outbreak of BFS occurred further east at New Harbour in 1995, totalling 234 ha of moderate to severe defoliation. This outbreak collapsed in 1996.

Hemlock Looper, *Lambdina f. fiscellaria* Guen.: There was a small hemlock looper control program in Cape Breton in 1997. Approximately 300 ha of balsam fir were aerially treated with *Bacillus thuringiensis kurstaki* (Btk). The area was divided into five treatment blocks based on high and extreme hemlock looper population levels.

A double application of Btk (Foray 48B) was applied aerially at 2.4 l/ha. The separation time between applications was approximately one week.

Reduction of larval survival in the treated areas ranged from 0 to 96 per cent and the overall reduction in larval survival was 67 per cent. For current foliage growth, the results saved ranged from 0 to 87.5 per cent. The overall current foliage saved was 50.1 per cent.

Indications are that the hemlock looper population is crashing on Cape Breton Island. There were only 1000 ha of visible defoliation.

The province-wide hemlock looper egg wash found hemlock looper populations on 1.6 million ha. Of this, 22 000 ha were at risk of showing high and moderate population levels. These areas were located in eastern Nova Scotia along the Canso Strait area and along the western shore of Cape Breton Island.

Whitemarked Tussock Moth, *Orgyia leucostigma*, J.E.Smith: Populations of this insect have increased rapidly in the province. Defoliation increased from zero ha in 1996 to 202 751 ha in 1997. Severe defoliation occurred in over 18 194 ha, causing heavy damage to all balsam fir trees in this area.

A province-wide egg mass count on 15,000 trees was completed by the end of December. The results: 450 000 ha with moderate and high egg mass numbers. The total area showing some level of infestation was 1.4 million ha.

An experimental block of 50 ha of Crown land tested the effectiveness of a double application of Foray 48B against late instar whitemarked tussock moth. The product was aerially applied at the rate of 4 litres or 50 BIU/ha.

It was too late to save any foliage in the trial area, but the trial showed

that Btk worked well on the whitemarked tussock moth. The reduction of survival in the treated area was 93 per cent.

PARKS AND RECREATION DIVISION

The provincial parks system is administered by the Parks and Recreation Division and the Regional Services Branch. The Parks and Recreation Division is responsible for parks system planning, park management planning, the park improvement budget, preparing development and operational standards, and information and marketing. The Regional Services Branch looks after park operation, maintenance, enforcement, and, in liaison with Parks Division staff, most improvement projects.

Provincial parks preserve natural environments and scenic landscapes, offer a variety of outdoor recreational opportunities, increase public awareness and appreciation of our natural and cultural heritage, and provide amenities for the travelling public.

In 1997-98, the park system included 123 operational parks, including 21 campgrounds, 98 day-use parks, one wildlife park, and three historic parks. These parks encompass approximately 9562 ha (23,628 a.). An additional 191 non-operational park reserves contained 21 215 ha (52,422 a.). The department was also responsible for 1100 km (684 mi.) of abandoned rail corridor, 97 beaches under the Beaches Act, 7 nature reserves containing 1379 ha (3,408 a.) under the Special Places Protection Act, and 31 protected areas totalling 289 632 ha (715,681 a.).

Park Planning and Development

The budget for planning, development and administration was \$2,020,000 in 1997-98, of which \$787,100 was directed to park and protected area development and capital maintenance. Planning, design, and management of over 40 capital improvement and repair projects were carried out at a number of provincial parks, including replacement of two trail bridges in North River Provincial Park, Victoria County; reconstruction of the bear enclosure at Shubenacadie Wildlife Park; and a new comfort station featuring flush toilets and showers in The Islands Provincial Park, Shelburne County. Numerous other trail, building, and landscape improvement projects were undertaken in provincial parks throughout the province.

Tourism and the Economy

Approximately two million people visit provincial parks each year. The number of nights sold at provincial campgrounds was 39,238, a 4 per cent decline from the previous year.

The department has formed partnerships with local community groups, organizations, and other levels of government to develop and/or manage some provincial parks and candidate protected areas. Partnerships under way in 1997-98 include Cape Chignecto, Cookville, Thomas Raddall, Black Duck Cove, and Port Hood Station Beach.

Cape Chignecto Provincial Park

In the spring of 1996, development of a 45-kilometre coastal hiking trail and associated back-country campsites was initiated at Cape Chignecto Provincial Park, Cumberland County, by a local community-based group in partnership with the Cumberland Regional Development Agency and the department. Natural Resources staff provided design guidelines and development standards and inspected construction work. Much of the coastal trail and associated facilities were completed in 1997-98, with an anticipated opening in the summer of 1998.

Thomas Raddall Provincial Park

Development of Thomas Raddall Provincial Park as a coastal destination camping park on Nova Scotia's south shore was initiated in 1989. In 1996, the governments of Nova Scotia and Canada approved \$249,000 in funding to complete the park development. Municipal governments agreed to contribute to the park operation and Thomas Raddall opened in June 1997.

Park Operational Review

A review of the operating park system was completed in 1997 with recommendations for improving the cost-effectiveness of parks, upgrading the quality of services provided to visitors, and enhancing connections with tourism and community economic development.

Protected Areas Legislation

In 1997, administrative responsibility for elements of the parks and protected areas system were re-assigned to the provincial Department of the Environment. Details are being finalized. The Wilderness Areas Protection Act was introduced in the provincial legislature in December 1997 by the Environment Minister to give formal protection to 31 wilderness areas.

Canadian Heritage Rivers Program

A management plan for the Shelburne River was developed by a management planning committee with representatives from Natural Resources, Bowater, and Parks Canada. Public consultation included an information mailout and two open houses. The management plan was reviewed by Cabinet and sent to the Canadian Heritage Rivers Board for designation. On September 19, 1997, a formal designation and plaque unveiling ceremony was held.

The Margaree-Lake Ainslie river system has been nominated for designation as a Canadian Heritage River. Staff continue to work with various levels of government, landowners, and other interested groups and individuals to effect designation.

Nature Reserves Program

Work continued on the development of a province-wide inventory of sites of ecological significance. This inventory is used in a variety of land-use planning and resource management initiatives, including integrated resource management (IRM) for Crown lands, as well as the environmental assessment process. Ten candidate nature reserves underwent an IRM review process, with management plans prepared for five of them.

Interpretive and Visitor Programs

Interpretive programming continued to expand in the parks, with over 100 events offered through the Parks are for People program, a cooperative effort involving the department, other government agencies, clubs, organizations, and interested individuals.

Campground Host Program

In 1996, the Campground Host Program was initiated on a trial basis in two provincial campgrounds. Hosts greet park visitors and give them basic information about the facilities and the local area. Because of its success, the program expanded to six additional camping parks in 1997.

PROGRAM DEVELOPMENT AND EVALUATION DIVISION

Staff delivered programs and services and supported the development and coordination of policies and programs emphasizing marketing, product development, industrial development, public service, education, and natural resource management. Staff coordinated the department's participation in several national initiatives including the Canadian Council of Forest Ministers

projects—the National Forestry Database Program, and Certification and International Issues Working Groups—and hosted a regional consultation workshop in support of the National Forestry Strategy, as well as the Federal/Provincial Parks Council projects, Parks Day, and Take a Hike. Staff coordinated a forestry tour from the Netherlands under the International Forestry Partnerships Program. Staff also represented the province on Industry Canada's National Wood Products Sector Team and Agriculture Canada's National Plant Protection Advisory Committee.

Efforts were extended on several trade policy issues such as the Canada/United States Softwood Lumber Consultations, United States Customs Compliance Measurement Program, and phytosanitary matters with the United States, Mexico, and the European Community. Staff assisted local companies in promoting and marketing Nova Scotia forest products through inbound trade missions from the United States, Sweden, Iceland, and Germany.

Staff facilitated diversity/employment equity workshops, and supported activities of the provincial Round Table on the Environment and Economy—Forestry Committee and the production of the first provincial *State of the Environment* report. A staff member was assigned to the Coastal Zone Management Committee under the Nova Scotia Round Table on the Environment and Economy. This committee is assessing methods to facilitate community implementation of planning and development initiatives in coastal areas. Staff participated in the development of the department's Occupational Health and Safety Policy and Program and in the Crown Land Integrated Resource Management planning process in all three regions, assisting in the implementation of the public consultation process. The division was also represented on the department's Provincial Parks' Operating System Review Committee.

Staff coordinated education programs for Project Wild and National Wildlife Week and hosted the Project Wild National Meeting. The division coordinates the Parks are for People program, with 101 events in provincial parks and on Crown land. More than 25,000 participants enjoyed these programs in 1998. Staff also trained provincial park staff, administered the Campground Host program in eight provincial parks, and assisted with the introduction of a computerized campground registration system for 10 provincial parks. Staff responded to hundreds of requests from the public, department staff, and other agencies on wildlife, outdoor recreation, marketing of Nova Scotia products, and forestry. Staff wrote several articles for *Nature's Resources* and *Knots & Nuggets*.

Staff participated on committees and/or projects with client groups such as the Nova Scotia Forest Products Association, the Maritime Lumber Bureau, Forintek Canada Corp., Trade Team Nova Scotia, the Atlantic Canada Homes Program, and the Nova Scotia Outdoor Leadership Development program. Staff continued to monitor the movement of roundwood within eastern Canada and worked with a team to design and implement new provincial regulations for a Registry of Buyers of primary forest products. Staff coordinated the second Becoming an Outdoors-Woman (BOW) workshop in Nova Scotia.

Forest Product Development

Staff administered the product development component of the Resource Enhancement Fund. The program helped fund the reprint of the *Hardwood Grading Manual*, a summer student for the Sawmill Improvement Program, purchase of research reports from Wood Products Group, Federal Income Tax/Woodlot Management Study, a Canada Tree project, FERIC membership, and subscriptions to various industry publications and reports.

The sawmill industry continued to have good sales although prices were lower than last year. Many mills continued to operate double shifts, which put pressure on the forest resource.

Mill owners continue to invest in upgrading their mills.

New Mills/Modernization

Ledwidge Lumber	Enfield	new curve sawing mill
C. F. Dickson	Westville	new stud mill
MacTara	Upper Musquodoboit	new stud mill
F. W. Taylor	Middle Musquodoboit	new mill
Harry Freeman	Greenfield	new stud mill
Comeau Lumber	Meteghan	new planing mill
Elmer Lohnes	Bridgewater	new mill (rebuilt from fire)

New Dry Kilns: Bowater, Oakhill; Lewis Lumber, Weymouth; Williams Bros., Barneys River

Staff attended the Northeast Logger Congress in Bangor, Maine, and the Eptek Show in Dartmouth. The following meetings were attended: the Maritime Saw Filers Educational Association annual meeting (Truro),

the Maritime Lumber Bureau (Charlottetown), Wood Product Group semi-annual meeting (Edmundston), the Maritime Saw Filers Educational Association Sawing Seminar (Enfield), the Wood Buyers Meeting (MacGowan Lake), the Forintek facility tour and meeting (Quebec City), and the Nova Scotia Forest Products Association (Truro).

Sawmill Recovery Studies were conducted at the following sawmills:

JAK	Mill Village	hardwood
Randy Kinsman	Cambridge	hardwood
B. A. Fraser	Margaree	hardwood
David Deveau	St Beloni	softwood studs
Eugene MacDonald	Indian Harbour	softwood logs
Holdright Lumber	Caledonia	softwood hemlock
Gary Marshall	South Range	softwood logs

WILDLIFE DIVISION

The Wildlife Division is responsible for the conservation and sustainable use of wildlife in Nova Scotia. Staff coordinate the monitoring of wildlife population trends and status, assess habitat quality and needs, and recommend management strategies.

The division is also responsible for the development and operation of the provincial wildlife park at Shubenacadie, Colchester County.

Large Mammals Section

The Large Mammals Section oversees the management of deer, moose, and bear.

Deer

The main programs for assessing the abundance, distribution, condition, age profile and rate of reproduction of deer are a province-wide Spring Pellet Group Index count, the Wildlife Investigation Reporting System, and reports from licensed hunters. In the spring of 1997, the pre-fawning deer herd size was about 58,000, up 26.7 per cent over the previous year. Licensed resident deer hunters (51,280) reported taking 9,750 deer, while 590 non-resident hunters took 113 deer under the antlered deer or "buck law" regulation, for a combined success rate of 19.0 per cent during the fall 1997 hunting season.

The reported harvest was distributed by county as follows (1995 and 1996 numbers presented for comparison purposes):

	<u>1995</u>	<u>1996</u>	<u>1997</u>
Lunenburg	812	932	1,118
Queens	354	386	447
Shelburne	288	271	343
Yarmouth	246	315	413
Digby	232	247	347
Annapolis	323	379	427
Kings	325	345	402
Halifax	492	676	795
Hants	537	633	854
Cumberland	570	685	842
Colchester	727	858	1,020
Pictou	653	777	869
Antigonish	309	283	355
Guysborough	399	417	527
Inverness	298	435	392
Victoria	67	46	103
Cape Breton	152	223	290
Richmond	235	256	319
Total Harvest	7,038	8,191	9,863
Total License Sales	52,257	52,275	51,870
Hunter Success	13.5%	15.7%	19.0%

The province was divided into seven deer management zones so that a limited number of antlerless deer hunting stamps could be issued in the future when deer numbers increase. Although no antlerless deer hunting permits were issued for the fall of 1997, hunters were advised of the new program in the 1997 Hunting & Furharvesting Summary of Regulations booklet, including a map of the zones and a legal description of their boundaries.

Bear

The main programs for assessing the abundance and distribution of bear on an annual basis are the Wildlife Investigation Reporting System and a compulsory reporting system by licensed hunters and trappers. The number

of reported non-hunting related mortalities of bears (mostly associated with nuisance/problem situations) was 22, compared with 30 in 1996. Department staff reported 171 problem bear situations, compared to 193 in 1996.

During the fall of 1997, hunting of black bears was permitted at registered bait sites only from September 8 through October 25. Five hundred and seventeen residents and 115 non-residents purchased bear hunting licences. From hunter report cards it was calculated that the total harvest by hunters was 155, compared with 223 bears taken by a slightly larger number of hunters in 1996. Snaring bears was permitted by licensed (resident only) trappers from October 10 through November 7. One hundred and sixty-two licences were purchased with a calculated harvest of 59 bears.

Moose

Despite closure of all legal hunting of moose on mainland Nova Scotia in 1981, the number of moose remains low. Although attempts were made to conduct aerial surveys to verify numbers and distribution, lack of continuous snow cover prevented the completion of these surveys. In an attempt to increase our knowledge of moose on the mainland, 11 moose in the Tobetic area of western Nova Scotia were equipped with radio transmitter collars during February and March 1998. These animals will be monitored over the next few years as part of a pilot study.

The moose herd in the Cape Breton Highlands area remains in good health and abundance (2500–3000). During the fall of 1997, 200 resident sport hunters were selected through a lottery draw from 12,192 applicants. They reported harvesting 183 moose (117 male and 66 female) from the highlands of Inverness and Victoria counties during a two-week mid-October hunt.

Wetlands and Coastal Habitats Program

Nova Scotia was an active partner in the Eastern Habitat Joint Venture (EHJV) and the Black Duck Joint Venture (BDJV) of the North American Waterfowl Management Plan during 1997–98. This partnership assists in the conservation of provincial, national, and international wetlands and waterfowl populations. In 1997–98, the value of the EHJV program in Nova Scotia was in excess of \$1 million.

Total wetland acquisition in 1997 was approximately 100 ha (246 a.) with an additional 212 ha (524 a.) brought under conservation agreements. The Province received 937 ha (2,315 a.) of saltmarsh, intertidal, and subtidal flats

in Cole Harbour as ecologically sensitive lands. Seven freshwater impoundments totalling 24 ha (59 a.) were constructed through the EHJV. Improvements and maintenance were carried out on six water control structures affecting 184 ha (455 a.) of wetland habitat. Open water marsh management was carried out at nine sites, enhancing 66 ha (162 a.) of habitat.

Nova Scotia initiated a cooperative biological control program for purple loosestrife involving Ducks Unlimited Canada, Canadian Wildlife Service, New Brunswick, Prince Edward Island, Nova Scotia Department of Agriculture and Marketing, and a private consultant. The control program uses predatory beetles (*Galerucella spp.*) and adult beetles were present in at least two sites from earlier releases. In 1997, over 4,000 beetles were reared at a central facility and released at a number of sites.

The Riparian Management Project provides for conservation of habitat along wetlands, lakes, rivers, and streams by controlling livestock access. Six new projects were completed or under way in 1997. The cost of fencing, alternative watering systems, and stream crossings is shared by the livestock producer and the EHJV.

The Loon Alert sign project initiated in 1996 continued with over 200 signs placed to-date on lakes throughout the province. They alert recreational and residential users of lakes and lake-shores of the conservation needs of the common loon. This program is delivered by Natural Resources in cooperation with the forest industry and private landowners.

A report on shorebird surveys in the upper Bay of Fundy was completed in 1997 in support of developing a stewardship action plan for the conservation of the natural resources of the Minas Basin RAMSAR and Hemispheric Shorebird Site.

Updating of the inventory and classification of freshwater and coastal wetlands in Nova Scotia continued. Cape Breton Island was completed and work is proceeding with the digitizing of maps for the remainder of the province for integration with the department's geographic information system.

Department staff participated in the annual spring American Woodcock Singing Ground Survey conducted throughout central and eastern North America. Trend analysis of Nova Scotia data shows there was a short-term

decrease in 1996-97, and a significant long-term decline (1968-97) averaging 1.7 per cent per year. Nova Scotia is part of the eastern region management unit for woodcock which has collectively experienced a significant long-term decrease in counts averaging 2.5 per cent per year.

Black duck breeding pair surveys were conducted by the Canadian Wildlife Service on 15 plots (5 km by 5 km blocks) distributed over the province. This was the eighth year of a long-term international project under the Black Duck Joint Venture. The survey design was modified from previous years but comparisons are still possible. Mean recorded densities of breeding black ducks in 1997 was 27.5 indicated pairs per 100 km² compared to 24.8 pairs in 1996 and 18.3 pairs in 1995. The number of breeding pairs continues to increase. Nova Scotia is included with New Brunswick and Quebec's Gaspé in stratum one. Trend analyses in numbers of pairs for the period 1990-97 indicates an increase (+7.3 per cent per year) in the breeding black duck population. Trend analyses (1990-97) of surveys over the range of the black duck suggest a range-wide decline averaging 3.1 per cent per year. Other waterfowl species were also recorded during the surveys.

Inventories of colonially breeding birds were conducted on selected islands along Nova Scotia's coast during the department's annual monitoring of the population status of common and endangered/threatened species. New sites were also inventoried to enlarge the information database used in environmental monitoring, environmental impact and aquaculture assessment, and nature-based tourism.

A mid-winter waterfowl inventory was conducted to identify the distribution and abundance of waterfowl following hunting season. The survey included all ice-free areas of the Atlantic coast and Bay of Fundy. The total number of waterfowl recorded was 66,241 birds, including 21,577 black ducks, 16,399 Canada geese, and 12,706 common eiders. This was a decrease over last year's high but above other years.

This past waterfowl season was the first year that non-toxic shot was required to hunt waterfowl in all of Nova Scotia. Although compliance in the Belleisle marshes was 100 per cent, improved from last year's estimate of 64 to 83 per cent, lead shot was still used in other areas.

Waterfowl permit sales were 7,731, a decrease of -10.7 per cent from 1996 and well below the peak of 16,297 in 1978. Preliminary estimates of

the 1997 waterfowl harvest are 74,203 ducks (all species) and 7,542 Canada geese. The 1997 snipe and woodcock harvest was estimated to be 390 and 1,252 birds respectively.

Department staff banded 874 waterfowl (recaptures not included): 336 black ducks, 9 mallards, 5 mallard/black duck hybrids, 10 green wing teal, and 184 female and 330 male common eiders. A new technique was developed to capture molting male eiders, and the number of banded male eiders is expected to increase over the next several years. An analysis of eider banding suggests the survival of females has decreased from 90 per cent (± 4 per cent) to 84 per cent (± 12 per cent) during 1972–88 and 1989–95 respectively. We have recommended a reduction for all sea ducks in the 1998 daily bag limit from 10 to 5 and a reduction in the possession limit from 20 to 10. The 1998 season will close by one week. This action was taken because of concern about the population status of many sea ducks.

Terrestrial Habitat

The Terrestrial Habitat Program works with the forestry and agricultural communities to protect and enhance wildlife habitat. The three main elements of the program are production and support for the Forest/Wildlife Guidelines and Standards, habitat inventory, including an inventory of the province's significant wildlife habitats, and research into wildlife/habitat relationships.

The release of the document *Toward Sustainable Forestry: A Position Paper* introduced the department's plans to make the Forest/Wildlife Guidelines and Standards mandatory on private and Crown lands. A draft of the Forests Act regulations required to bring this about were included with the position paper. These regulations are the result of work by department biologists and foresters to update the guidelines so they reflect recent research and experience over the last 10 years. Consultation with interest groups continues.

Measuring how much forested wildlife habitat we have in the province is a major effort within the Terrestrial Habitat Program. To maintain the diversity of our native plant and animal life, we must ensure that all natural forest types are represented in a variety of age classes across all landscapes. Our long-term goal is to have a list of habitat types and an inventory of the number of hectares comprising each. Working with the Parks and Forestry divisions, staff have spent a great deal of effort developing ecological maps that will lead to these habitat types. This is supported by the GIS mapping of all forests in Nova Scotia, and staff have

received training in this technology. Also linked to this work is the extensive forest inventory the department has conducted over the last 20 years. Habitat staff have been involved with revising the inventory procedures that became necessary as a result of budget reductions in recent years.

The inventory of significant wildlife habitats has grown over the last year through the efforts of regional biologists. Sites of rare species, large concentrations of animals, or rare habitats are mapped and data on the site collected in a new computer database developed over the past few months. This information is vital in environmental impact assessments and integrated resource management. It also plays a role in planning for protected areas and designing wildlife inventories. In the seven western counties alone there are over 2,900 occurrences of species that are important to our inventory. This project links to an international effort to monitor species and habitats for protection and research.

A review of all provincial sanctuaries and wildlife management areas has started. An internal committee developed criteria against which to measure the value of these areas. With input from field staff, and in concert with other protected areas programs within government, the committee will recommend whether the province should continue to maintain or modify these sanctuaries and wildlife management areas.

The Wildlife Division developed a web page that describes the programs and projects under way within the division. The text of *Wildlife of Nova Scotia* is available on the site and describes many animals native to Nova Scotia. The site also provides up-to-date information about endangered species and a place to register any sightings of unusual or rare species in the province. A page of answers to frequently asked questions provides the wildlife information most often requested from department staff.

Furbearers and Upland Game Section

Furbearers

The number of fur harvester licences decreased by about 4 per cent in 1997-98, with 1,933 sold. There was a slight increase in the success rate, with 64.5 per cent reporting taking fur. Average fur prices were generally weaker than 1996-97 but better than 1995-96. Price decreases were seen in all species except otter.

The situation in the European market moved toward a resolution with the signing in December 1997 of the International Agreement on Humane Trap

Standards between Canada, the European Union (EU) and Russia, thus removing the immediate threat of the loss of European markets.

Canada continued to develop standards through the Canadian General Standards Board process in 1997-98. Nova Scotia is an active participant in this initiative. Draft standards for restraining traps and submersion traps were approved in principal in April 1997. Final revised drafts were at or near completion by the end of 1997-98. This will ensure that Canadian standards are in place should the international agreement ever collapse. They incorporate standards developed by Canadians from the trapping industry, government, and other concerned sectors. They deal with all aspects of this issue including user and public safety, efficiency, and economics, and provide supplementary criteria for decisions on certification of traps for use in Canadian jurisdictions.

Marten and lynx seasons remained closed. Low populations continue to persist on Cape Breton Island. A project to better assess presence and distribution of marten in the Cape Breton Highlands area continued in cooperation with Parks Canada during the winter of 1998. An effort to collect similar information on lynx was formally included in the marten survey project this year. On the mainland, accidental capture of marten by trappers and occasional sightings in western counties suggest that the reintroduction at Kejimikujik National Park may be showing some success. While there have also been a few incidental captures of lynx on the mainland in recent years, the presence of a permanent resident population has yet to be determined. The fisher population continues to improve in Cumberland, Colchester, and Pictou counties. While the season remains officially closed, regulation changes allow a trapper to keep one fisher if accidentally caught in a trap set for other species. The program to relocate live-captured fishers continues to be suspended.

Beaver populations continue to be censused by helicopter using randomly selected four-by-four kilometre grids. The population continues to be high.

Other methods used to assess furbearer population trends are harvest levels and species abundance reported from furharvester licences and fur buyer records, input from DNR staff, and nuisance complaints.

Most species harvests were down significantly from last year with only bobcat showing a slight increase (Table 10). Weak prices and uncertain

markets in recent years may continue to result in reduced efforts by furharvesters.

Ninety-three students attended the mandatory Fur Harvester Education course. Since it began in 1986, 1,158 students have attended 57 courses.

Upland Game

Resident small game licence sales were down 8.9 per cent from 1996-97 with 21,666 issued (free senior citizen licences not included). The calculated kill from the report cards for snowshoe hare, ruffed grouse, and ring-necked pheasants is reported in Table 11. Ruffed grouse harvests declined again this year by 41.7 per cent. The snowshoe hare harvest decreased 27.1 per cent from last year. Pheasant harvests increased by 10.1 per cent from last year.

Our spring hare pellet surveys indicate that the overall population is beginning to decrease from a peak in 1996-97. Only the Western Region showed an increase in 1997-98. Abundance rankings from 1,730 small game licence returns suggest similar populations with average ranks of 1.82 in 1996-97 and 1.83 in 1997-98 (based on the following rank codes: 0=none, 1=low, 2=medium, 3=high, 4=very high).

The abundance rankings of ruffed grouse also showed average ranks essentially unchanged, with 1.33 in 1996-97 and 1.34 in 1997-98.

From a limited number of respondents in the Annapolis Valley (230), rankings suggest increasing pheasant populations with an average rank of 1.92 this past year compared with 1.67 in 1996-97.

Biodiversity Section

The Biodiversity Section is responsible, in partnership with other governments, industry, non-government organizations, and the public, for the conservation and sustainable use of a large number of mammals, birds, amphibians, and reptiles in the province. These include species at risk (endangered or threatened species).

Progress was made on the implementation of the National Accord for the Protection of Species at Risk through the revision and coordination of provincial and national programs. Bill 51, *An Act Respecting Endangered Species*, was revised. This required staff participation at national meetings and workshops and work on national committees under the Accord initiative.

The implementation of the recovery plans for roseate terns, peregrine falcons, piping plovers, harlequin ducks, and Blandings turtles continued. This year effort was placed on the recovery and conservation of coastal plain flora, a group of plants that include nine species listed by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) as at-risk in Canada. The recovery team completed the first stage by reviewing the status of over 60 species and priority setting for habitat for these species. Work is under way to complete the recovery plan and continue with priority conservation actions.

A two-year project led by Dalhousie University on the breeding biology of roseate terns on Country Island was completed. The Blandings turtle recovery plan was formally approved by RENEW. Peregrine falcon surveys determined this endangered species is again breeding in Nova Scotia.

Work on the evaluation and designation of species at risk included attending the annual meeting of COSEWIC and preparing reports on the history and status of pine marten and several plant species.

A species status evaluation process for monitoring the general status of wildlife species is now under way, with special groups formed and evaluations completed for all mammals, breeding birds and coastal plain plants. This information will be used to set species priorities for formal species status evaluation in the province and for planning and decisions that will prevent species from becoming at risk. Evaluation of amphibians and reptiles, butterflies, and dragonflies and damselflies is the next phase of this program.

A workshop on the conservation of bats in Nova Scotia was held in cooperation with the Nova Scotia Museum of Natural History. This workshop served to raise awareness about bats in the province and was an opportunity to determine what is known about bats and what conservation actions are required.

A study of goshawk habitat and forest use was conducted in partnership with the Acadia Centre for Wildlife and Conservation Biology. Habitat loss and degradation of this species and its use as an indicator species are being examined. Research continued on the key role that the amphipod *Corophium volutator* plays in the Bay of Fundy ecosystem. Acadia and Carleton universities are partners in this work.

Priorities for next year will center on implementation of the national accord, especially moving forward endangered species legislation.

Provincial Wildlife Park

The Provincial Wildlife Park in Shubenacadie attracted visitors from Nova Scotia and abroad. The Park, including the picnic area and Creighton Environmental Centre, were open from May 15 to October 15.

Improvements/replacements of animal enclosures continued and the new bear enclosure was completed in late March. Additional picnic shelters were constructed and further improvements to picnic and playground facilities were made.

Guided tours through the Parks are for People program were provided and included participation from the Nova Scotia Falconry Association. One of the Creighton Environmental Centre buildings was renovated into a classroom and education programs for school classes started in November. A total of 1,500 school children in grades primary through 9 had participated by the end of March. The program will be further developed to cover a wider range of wildlife and habitat education. This classroom was used during the summer for the first annual "Winter in the Wildlife Park" photo exhibit by the Photographic Guild of Nova Scotia.

Several documentaries and articles were done about the park. The park was booked for wildlife photography most weekends in the winter and is becoming popular with both amateur and professional photographers. A food drive was held at the park in March for local food banks.

Attendance for the year was approximately 104,000, with public donations totalling \$4,000. This is up slightly from last year.

PLANNING SECRETARIAT

Graphics and Mapping Section

The Graphics and Mapping Section provided support to an internal client base in the production of technical reports, audio-visual presentations, and graphic files for resource mapping. The photographic unit reproduced resource maps for internal use and publications, furnished slides for audio-visual presentations, and did location photography on a variety of projects which were used in various mediums.

The section prepared maps showing Tussock Moth infestation and offshore and onshore petroleum holdings and provided interpretive panels for Thomas Raddall and Battery Point Provincial Parks and the Shubenacadie Wildlife Park. A series of audio-visual presentations on Integrated Resource Management (IRM) were completed and detailed scientific and promotional posters relating to mining and exploration in Nova Scotia were created for major symposiums in Vancouver, Toronto and Halifax. Photographic and graphic support was provided to several department periodicals, such as *Nature's Resources* and the *Report of Activities*.

Information Management Section

The Information Management Section includes the Library, Central Registry, and Mailroom. This section provides library and information service to staff, other government departments, industry, business and education communities, and the public; provides access, retrieval, storage, and disposal of active, semi-active, and inactive correspondence for the department; and ensures timely delivery of mail, faxes, and courier service.

In 1997-98, 935 people (excluding staff) visited the library. One thousand information requests were processed each month.

Staff continued to develop the automated library catalogue with plans to make it accessible in regional offices. Library holdings include 15,000 books, 17,000 maps, 200,000 air photos, 6,000 exploration assessment reports, 1,000 open file reports, 300 journals, 500 annual reports, and many government documents. A total of 1,234 items were catalogued, 500 inter-library loans processed, and 2,433 items circulated from the library. The library distributed 7,354 publications, 2,634 white prints, and 1,426 maps.

Access, retrieval, and storage of active, semi-active, and inactive correspondence for the department was provided. Eighteen hundred new files were created, 93 boxes were destroyed, and five boxes were transferred offsite.

Procedures were developed to implement the Resources CSU records; to relinquish DNR's files to other departments, agencies, boards and commissions; to streamline records destruction in field offices; and to dispose of records in field offices and the Halifax office.

Staff continued with the STOR development, as well as the development of CROPS Phase II and User View Screens. The implementation of STAR/STOR in the regions was started, beginning in the Western Region where files were inventoried and purged.

Department staff were trained in organizing records according to provincial government standards. Training of staff in regional offices started.

Efficient and prompt disposal of records was provided once the administrative, legal and fiscal value ceased, while preserving those of value to the province, as authorized by the Retention and Disposition Schedule approved under Order-in-Council.

As host department for the Resources CSU, the department's mailroom was responsible for handling personnel, payroll, and financial mail for Natural Resources, Environment, Fisheries and Aquaculture, and Agriculture. Each month, more than 5,200 pieces of metered mail were processed, 850 faxes were received and sent, and 1,000 packages were sent and received by courier.

Planning and Administration Section

The Planning and Administration Section provided policy research and advice on analytical techniques; ensured that the department's planning and policies were coordinated across all branches and consistent with government priorities; coordinated the preparation of briefing material, business plans and other information; looked after administration of the department's space requirements, risk management, and business equipment; administered office supplies, emergency plans, and security measures for the Halifax office; and looked after the department furniture and equipment inventories.

Section staff coordinated preparation of briefing material for the spring and fall sittings of the Legislature. They assisted the Petroleum Development Agency (PDA) with natural gas regulatory issues, development of the Gas Distribution Act, and monitoring the Sable gas hearings in the spring of 1998.

Staff worked with the Minerals and Energy Branch to monitor and respond to proposals to modify the Canadian Coast Guard's marine services fee. They also worked closely with staff from the federal Transportation and Communications Department to communicate the department's and province's concerns to the Coast Guard and the federal Department of Fisheries and Oceans.

Staff prepared the department's business plan and coordinated the outcome measures process.

Section staff also coordinated a business planning session for management, including identification of department programs and a review and evaluation of each program based on a consistent rating system.

Support was provided to the department's Integrated Resource Management/Land Use Committee and department input was coordinated for several policy initiatives from other departments which impacted on the management of natural resources on Crown lands.

Policy advice and assistance was provided relating to the government's response to the Westray Inquiry report and reassignment of responsibility for protected areas to the Department of the Environment.

Staff contributed to the awareness raising phase of the Information Policy Initiative (IPI) through presentations on the IPI findings to senior management staff throughout government. Feedback generated from these sessions was used to identify priorities for the subsequent IPI phase.

Systems were prepared to track Occupational Health and Safety related training for staff and the occurrence of incidents which did or could potentially have caused an injury to staff.

Space planning for Halifax office staff and identifying facility requirement tenders for staff in Truro and Halifax for leased space was carried out by section staff. The temporary relocation of Human Resources and Information Technology Corporate Services Unit staff to alternate office space was coordinated.

Furniture and equipment inventory records were maintained for the department's 47 field locations and the Halifax office, and acquisition and disposal of furniture and equipment was coordinated by staff.

Publication and Communications Section

Publications and Communications continued to produce or coordinate production of most department publications, exhibits, and advertising. Staff coordinated the production of audio-visual materials and operated an audio-visual loan library.

Staff filled over 528 written requests for publications as well as daily telephone, e-mail, and in-person requests for printed materials. This office also supplies DNR offices with publications for local distribution.

The video loan library has over 300 titles. Approximately 800 loans were made to teachers, youth group leaders, and the public.

Funding was provided to district offices and other divisions participating in six local agricultural fairs and trade shows. Several exhibits were displayed at annual meetings, career days, and field days.

Location shooting and preliminary editing took place on a video dealing with passenger safety for staff and other government employees who fly in DNR helicopters.

Advertising was placed for wildfire prevention, hunting safety, provincial parks, renewable resource management, public consultations, Registry of Buyers, and special weeks and events.

A new department publication, *Nature's Resources* (issued three times a year), was launched in September 1997. Free copies are distributed through DNR offices, Access Nova Scotia locations, schools, and libraries. The employee newsletter *Knots and Nuggets* was produced quarterly and *Trappers Newsletter* was issued in the fall. Production coordination was supplied for the department's annual report, forest management materials, hunting regulation summary, park related materials, deer management crests, integrated pest management leaflets, regional integrated resource management overviews, *Toward Sustainable Forestry: A Position Paper*, and a home study module. A third printing of *Grading Standing Hardwood in Nova Scotia* was initiated.

Staff worked with an external author and publisher to write, edit, and design *Shrubs of Nova Scotia*, which will be a companion publication to the successful books *Wildlife of Nova Scotia* and *Trees of Nova Scotia*.

The department's webpage, www.gov.ns.ca/natr, added homepages for the Wildlife Division, Hunter Education, and the Registry of Buyers. Division pages generate numerous requests for information. On average the department's website receives between 10,000 and 13,000 visits each month, the majority of which come from Canada and the United States.

INTEGRATED RESOURCE MANAGEMENT

Western Region

The Western Region's Integrated Resource Management (IRM) Project Planning Team's terms of reference were approved by the Integrated Resource Management/Land Use Committee in October. The terms of reference outline the steps the region will follow to complete the IRM project by December 1999. The project's core planning team held monthly meetings and guided the project through steps 1 to 3. These included the organization of the planning team, a defined terms of reference, preliminary goals and objectives, identification of preliminary issues, briefing of all regional staff, identification of Crown land commitments (i.e., lease and licences), assembly of resource inventories, preliminary resource analysis, and preparation of Phase 1 of public consultation. The Western Region has used the experiences and advice from the Central and Eastern Regions, which has helped to ensure the project is on schedule and completed by December 1999 as part of the IRM Land Use Strategy for Crown Lands.

Central Region

During 1997-98, the IRM team for Central Region collected resource data for Halifax and Hants counties. From this a digital IRM overview commitment maps for resource sectors were published, along with two reports: Managing Natural Resources on Crown Lands, An Overview of Halifax and Hants Counties and Managing Natural Resources on Crown Lands, Inventories of Halifax/Hants Counties. An IRM newsletter was printed for clients in the Central Region. As well, Phase 1 public consultation was conducted in Halifax and Hants counties. This included workshops, targeted briefings, interviews, and mail-in responses from approximately 400 people. The Cumberland and Colchester county overview commitment maps were updated to digital format.

Eastern Region

A percentage of Crown land in the seven eastern counties is licensed to Stora Port Hawkesbury Ltd., therefore a joint DNR/Stora working group designed a public consultation process to satisfy IRM requirements and the Stora Long Term Plan. A summary of current information on forestry, geology, mining, wildlife, recreation, parks, and Crown leases was mailed to

over 1,200 individuals and groups with an interest in Crown land management. Staff with Stora, Natural Resources and federal, provincial, and municipal governments with an interest in Crown land attended workshops to give their input to the process. Approximately 400 individuals attended these sessions. Every grade six class in the seven eastern counties was visited by staff to explain what we were doing and ask students to discuss IRM with their parents and fill out a short questionnaire.

Public workshops will be held in the next fiscal year throughout the seven eastern counties to gather public input about the management of resources on Crown lands.

TABLE 1

LANDS RECONVEYED TO THE CROWN BY COUNTY, 1997-98

Counties	Acres	Hectares
Annapolis	563	228
Antigonish	96	39
Cape Breton	462	187
Colchester	67	27
Cumberland	0	0
Digby	0	0
Guysborough	168	68
Halifax	1581	640
Hants	0	0
Inverness	855	346
Kings	2	1
Lunenburg	1149	465
Pictou	118	48
Queens	282	114
Richmond	208	84
Shelburne	567	229
Victoria	620	251
Yarmouth	650	263
Total	7388	2990

TABLE 2

LANDS RECONVEYED TO THE CROWN BY PURPOSE, 1997-98

Purpose	Acres	Hectares
Timber Reserve	2899	1173
Recreation Area	3509	1420
Park Reserve	116	47
Beaches	15	6
Provincial Park	2	1
Protected Area	719	291
Historic Site	91	37
Ducks Unlimited	37	15
(Eastern Habitat Joint Venture Program)		
Transfer of Administration and Control	7	3
Total	7395	2993

TABLE 3
SUMMARY OF NOVA SCOTIA MINERAL PRODUCTION, 1997

Description	1997 Value¹ (Preliminary)	1997 Employment* (Preliminary)
METALS		
Total metals ²	00	n/a
INDUSTRIAL MINERALS		
Non-Metals		
Anhydrite	\$ 2,148,000	
Barite	731,000**	
Gypsum	72,463,000	
Limestone ³ and Dolomite	2,019,000	
Peat	1,716,000**	
Salt	60,312,000**	
Silica	2,000,000**	
Total Non-metals	141,389,000	880
Structural Materials		
Dimension Stone	368,000	
Cement	32,260,000**	
Clay Products	4,680,000**	
Crushed Stone	32,000,000	
Sand & Gravel	17,600,000	
Total Structural Materials	86,908,000	785
Total Industrial Minerals	228,297,000	1,665
FUELS		
Coal	157,479,000	1,853
Petroleum—Crude	117,450,000	340
Total Fuels	274,930,000	2,193
CHANGE FROM PREVIOUS YEAR	-19%	-3.5%
TOTAL MINERAL PRODUCTION	\$503,000,000	3,860

¹ Estimated from Department of Natural Resources sources.

² There were no metal mines operating in 1997.

³ Does not include the value of limestone quarried for cement production.

* Average number of persons employed during production period.

** Processed or manufactured value.

Note: Production represents shipments; sum of components may not add due to rounding.

TABLE 4
FOREST MANAGEMENT ACTIVITIES ON PRIVATE LANDS, 1997-98

TREATMENTS	REEF		JMP		FSP		CBEP	
	Dollars	Hectares	Dollars	Hectares	Dollars	Hectares	Dollars	Hectares
Site Preparation	331,867	1,544	88,157	339	29,344	110	272	
Planting	545,640	1,622	538,175	1,664	23,400	69	171	
Stock Acquisition	285,058		451,491		22,335			
Weeding	1,322,466	4,436	809	2	7,223	17	42	483
Pre-Commercial Thinning	502,021	752	951,473	1,100	32,412	44	109	81,714
Commercial Thinning	104,802	181						
Shelterwood	155,010	260						
Site Clearing	175,888	693						
Stand Conversion	20,299	41						
Seed Tree	6,621	36						
Other Treatments	1,767							
Total	3,451,438	9,565	2,030,105	3,105	114,714	240	594	95,575
								101
								249

REEF = Resource Enhancement Fund—Forestry

JMP = Joint Management Plan

FSP = Forest Stewardship Program

CBEP = Cape Breton Enhancement Program

TABLE 5
PROVINCIAL CROWN LANDS FOREST PRODUCTS—VOLUMES SOLD BY LICENCE AGREEMENT, 1997

COMPANY	Annual Allowable Cut *		Utilization *											
	Volume Under Agreement		Softwood Sawlogs MFBM (m ³)	Hardwood Sawlogs MFBM (m ³)	Softwood Pulpwood Cords (m ³)s	Hardwood Pulpwood Cords (m ³)s	Fuelwood Cords (m ³)s	Studwood Cords (m ³)s	Palletwood Cords (m ³)s	Chips Tons (Tonnes)				
	Sawn Prod.	Other Prod.												
Stora Port Hawkesbury Ltd.	MFBM (m ³)	Cords (m ³)s	3776	247	104 625	2838	1045			251	41 057			
Richmond Co.		1 196 105	21 333	1395	379 219	10 288	3789			909	37 257			
Kimberly-Clark Ltd.		50 000	4170		14 478	417								
Piclou Co.		181 228	23 556		52 477	1511								
Brookfield Lumber Co. Ltd.	500		587		1052		83							
Colchester Co.	2825		3315		3815		301							
ABT Building Products Canada Ltd.		25 000	528	1	566	3031	31	305						
Lunenburg Co.		90 614	2982	7	2052	10 966	111	1105						
E.M. Comeau & Sons (1977) Ltd.	599	470	913	10	717		620	18						
Digby Co.	3383	1704	5157	56	2598		2251	66						
N.F. Douglas Lumber Ltd.	800		316		765	377								
Queens Co.	4520		1788		2773	1366								
Elmsdale Lumber Co. Ltd.	1150		384				130							
Hants Co.	6498		2167				469							
F.W. Taylor Lumber Ltd.	1000		60				30							
Halifax Co.	5650		339				109							
Heller Forest Products Ltd.	1000		890				305	192						
Halifax Co.	5650		5028				1105	696						
Harry Freeman & Sons	1000		841	1	380	223	105	33						
Queens Co.	5650		4751	7	1376	807	380	118						

TABLE 5 (CONTINUED)

PROVINCIAL CROWN LANDS FOREST PRODUCTS VOLUMES SOLD BY LICENCE AGREEMENT, 1997									
COMPANY	Annual Allowable Cut *		Utilization *						
	Sawn Prod.	Other Prod.	Softwood Sawlogs	Hardwood Sawlogs	Softwood Pulpwood	Hardwood Pulpwood	Hardwood Fuelwood	Studwood	Chips
	MFBM (m ³)	Cords (m ³)	MFBM (m ³)	MFBM (m ³)	Cords (m ³)	Cords (m ³)	Cords (m ³)	Cords (m ³)	Tons (Tonnes)
Garnico Lumber Ltd.	1000		45		945	281	1700		
Picou Co.	5650		254		3425	1020	6162		
C.E. Harrison & Sons Lumber Ltd.	700		580		296		137		
Cumberland Co.	3955		3276		1073		498		
Hogg Brothers Lumber Ltd.	700		936		1320	140	56	463	
Cumberland Co.	3955		5286		4786	506	203	1677	
Kingsion Lumber & Building Supplies Ltd.	600								
Kings Co.	3390								
Lepper Brook Colchester Co.	n/a**	n/a**	48		51				
Lewis Sawmill Co.	1000		271		185				
Digby Co.	650		834		662		567		
Elmer Lohnes Lumbering Ltd.	300		4714		2401		2055		
Lunenburg Co.	1695								
MacIsaac Ltd.	up to 12 000 ***		5118		7160	54	2226	114	
Hallifax Co.	up to 67 800 ***		28 914		25 953	195	8069	412	

TABLE 5 (CONTINUED)
PROVINCIAL CROWN LANDS FOREST PRODUCTS VOLUMES SOLD BY LICENCE AGREEMENT, 1997

COMPANY	Annual Allowable Cut *			Utilization *									
	Volume Under Agreement		Cords (m ³ /a)	Softwood		Hardwood		Softwood		Hardwood		Softwood	
	Sawn Prod.	Other Prod.		Sawlogs	MFBM (m ³)	Sawlogs	MFBM (m ³)	Pulpwood	Cords (m ³ /a)	Pulpwood	Cords (m ³ /a)	Sturdwood	Cords (m ³ /a)
Murray Reeves Forestry Ltd.													
Lunenburg Co.	300			76					309		132	96	
	1695			430					1120		480	349	
Pugsley Lumber Ltd.	200												
Colchester Co.	1130												
Sproule Lumber Ltd.	4500	28 688		7557		11		16 042		269		762	
Colchester Co.	25 425	103 980		42 694		59		58 145		975		2762	
Wentworth Lumber Ltd.	360			417				366				446	
Cumberland Co.	2034			2355				1327				1616	
Russell White Lumber Ltd.	822	641		124				452		110		158	
Hants Co.	4646	2323		703				1639		400		572	
Two Rivers Lumber Ltd.	360 *			284				925				141	
Colchester Co.	2034 *			1607				3352				511	

* The annual utilization may exceed the annual allowable cut volume under agreement, provided there is a deficit in cut in previous years or there is a cutting requirement to salvage dead and dying material

** The primary objective of the Lepper Brook Agreement is to promote high water quality, therefore the Annual Cut is determined accordingly.

*** Backup to private sector supply, up to total mill requirement identified in 1991 (60,000 MFBM)

NOTE: All licensees are required to sell other roundwood products, other than those useable in the mill, in accordance with approved cutting designations to fulfil volume commitments. Licensees may be required to first offer these products to other Crown licensees to assist in fulfilling the license commitments with specific licensees, where applicable.

TABLE 6

CROWN LAND FOREST MANAGEMENT PROGRAM, 1997

	Unlicensed Crown	Stora Forest Industries Ltd.	Kimberly Clark Ltd.
Silviculture (ha)			
Uniform Shelterwood	58.4		
Stand Conversion	1.5		
Site Clearing		344	
Salvage	135.7		
Low Quality Allowance (m ³)s		111 813	
Site Preparation			
Mechanical	118.85		
Chemical			11.1
Stock Acquisition			
Regular (MT)	324.39	1529.56	358
Boy Scout (MT)	45.83		
Planting	187.8	881	207
Precommercial Thinning	370.53		
Plantation Spacing		940	
Release Spacing		1036	
Commercial Thinning	395.59		
Manual Weeding	12.16	235	
Chemical Weeding	156.8		241.5
Access Roads			
Road Construction (km)	10.3	10.43	
Bridge Construction (#)	2		
Culvert Replacement (#)	36		
Road Maintenance (km)	121.6		
Grading (km)	254		

TABLE 7
TOTAL NUMBER OF CHARGES, 1997

District	Crown	Forests	Wildlife	Parks	Beaches	Off-Hwy.	MBC	Total
Antigonish	1	4	13					18
Aspen			17					17
Baddeck	1	1	23		1	6	1	33
Bible Hill & Hants East		11	14			2	4	31
Bridgewater	2	7	24	4			8	45
Coxheath		2	41	9		2	1	55
Digby		5	25			3		33
Guysborough	4		7					11
Halifax East	2	4	43	14			3	66
Kentville		8	21			1	2	32
Lawrencetown		2	4					6
McLellan's Brook		5	23	4	1	1		34
Milton		2	11			1	2	16
Oxford		2	19					21
Parrsboro			9					9
Sheet Harbour		1	4				7	12
Shelburne			14				1	15
St. Peter's		1	10	1		1	14	27
Tusket			17	3			3	23
Waverley		1	21	1	1	4		28
Whycocomagh	6	2	35	4	2	19	27	66
Windsor								
Totals	16	58	305	40	5	40	73	598

TABLE 8

TOTAL NUMBER OF WARNINGS, 1997

District	Crown	Forests	Wildlife	Parks	Beaches	Off-Hwy.	MBC	Total
Antigonish	2	4	16		1			23
Aspen	5	1	26			9	3	44
Baddeck		34	96	7		10		147
Bible Hill & Hants East	4	52	23			24		103
Bridgewater	2	15	36	4	2	3	2	64
Coxheath	1	2	53	4		3		63
Digby		3	12	9	1	2		18
Guysborough	2	4	20			5	1	32
Halifax East		9	35	5		6		55
Kentville	1	21	23	2		1		48
Lawrencetown		13	4					17
McLellan's Brook		2	17	4		1		24
Milton		6	13			6	5	30
Oxford		4	9				1	14
Parrsboro	2	20	91		16	66	14	209
Sheet Harbour		6	6	1		20		33
Shelburne			5				2	7
St. Peter's		5	44	3		6		58
Tusket		5	133	1	1		3	47
Waverley	4	6	17			3		26
Whycocomagh		5	28	1	1	26		61
Windsor								
Totals	23	222	602	32	22	191	31	1123

TABLE 9
REPORTED OR KNOWN BY DEPARTMENT, 1997

District	Crown	Forests	Wildlife	Parks	Beaches	Off-Hwy.	MBC	Total
Antigonish	10	11	91	2	4		2	120
Aspen	9	1	82	1		9	5	107
Baddeck	15	38	181	10	4	7	5	260
Bible Hill & Harris East	10	97	287		1	15	1	411
Bridgewater	14	52	206	9	4	4	9	298
Coxheath	4	17	174	17	1		8	221
Digby	5	24	82	2	6	7	4	130
Guysborough	10	7	59	3	6	5	3	93
Halifax East	9	18	165	20	1	6	32	251
Kentville		21	95			1	7	124
Lawrencetown		16	42					58
McLellans Brook	13	15	136	15	24	4	1	208
Milton	10	18	104	2	4	6	23	167
Oxford	2	3	68		1	1	1	75
Parrsboro	8	27	174	6	11	22		248
Sheel Harbour	6	4		1	2		13	65
Shelburne	7	11	50	12	6		7	93
St. Peter's	8	10	131	5	1	6	22	183
Tusket	30	32	186	40	6	2	28	324
Waverley	9	1	62	3	3	3		81
Whycocomagh	2	7	176	6	2	18		211
Windsor	181	430	2590	154	87	116	170	3728
Totals								

TABLE 10
FURBEARING ANIMALS TAKEN BY FUR HARVESTERS FROM (1989-1996)

	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Beaver	2,400	2,368	2,769	3,340	4,801	7,677	6,090	8,642	6,385
Muskrat	14,178	10,719	14,115	11,420	12,956	18,248	22,118	36,834	31,331
Otter	218	226	378	415	585	1,027	797	765	555
Mink	1,445	1,229	1,362	1,609	1,531	1,929	1,829	2,168	1,681
Lynx	1	1	2	0	0	0	0	0	4
Bobcat	345	420	311	337	499	809	703	976	1,029
Fox	694	626	894	1,147	846	1,741	1,118	1,549	898
Raccoon	1,390	911	1,997	2,745	3,599	6,676	5,435	6,490	6,165
Weasel	402	224	232	522	1,164	1,207	1,375	1,037	602
Squirrel	1,402	658	3,800	4,112	1,914	6,852	8,355	6,890	5,199
Skunk	18	17	25	35	122	168	131	229	74
Fisher	4	3	3	11	9	16	124	217	184
Coyote	406	777	865	1,276	1,087	1,887	1,155	1,311	1,031

TABLE 11
ESTIMATED HARVEST OF UPLAND GAME

County	Sawtooth Hare			Ruffed Grouse			Phoeasant	
	1955-56	1956-57	1957-58	1955-56	1956-57	1957-58		
Annapolis	7,788	4,214	6,634	6,554	2,265	1,626	988	1,063
Digby	10,202	12,168	29,108	5,975	2,239	2,657	964	1,916
Kings	10,408	13,432	11,044	4,241	2,357	2,141	2,963	3,027
Lunenburg	21,948	18,514	13,074	7,607	5,215	3,043	342	612
Queens	7,042	14,010	9,660	8,160	3,924	2,029	26	16
Shelburne	11,668	22,570	19,288	3,071	2,449	1,674	51	113
Yarmouth	25,902	20,436	17,838	5,320	2,541	1,626	579	596
Western Region	95,038	105,344	106,646	40,928	20,990	14,796	5,859	7,343
Antigonish	12,618	14,564	8,468	5,101	2,186	2,061	0	0
Colchester	16,218	18,330	7,246	11,334	6,953	4,814	668	821
Cumberland	19,780	27,942	13,106	11,514	7,295	5,345	887	837
Guysborough	15,780	21,806	8,372	8,802	9,257	3,590	0	0
Halifax	27,140	29,418	24,666	11,012	7,440	3,091	681	499
Hants	19,764	20,384	15,360	5,436	4,240	3,107	1,850	1,755
Pictou	8,378	13,116	3,704	8,789	6,266	3,059	0	48
Eastern Region	119,378	145,560	80,922	61,988	43,639	25,067	4,086	3,960
Cape Breton	31,992	41,506	22,380	8,725	3,990	1,932	26	48
Inverness	64,790	76,164	48,558	17,116	11,101	4,911	51	32
Richmond	21,922	24,808	18,258	7,170	4,003	1,948	0	0
Victoria	25,648	23,070	12,590	8,892	3,015	1,304	0	0
C.B. Region	144,352	165,548	101,786	41,903	22,109	10,095	77	81
Unknown	1,350	13,484	24,118	244	2,067	1,787	0	467
Provincial Total	360,118	429,936	313,466	145,062	88,805	51,745	10,758	11,848